

THE MILITARY DECISION-MAKING PROCESS:
TIME FOR A CHANGE

A MONOGRAPH
BY
Major Wilson A. Shoffner
Field Artillery

School of Advanced Military Studies
United States Army Command and General Staff College
Fort Leavenworth, Kansas

First Term AY 99-00

Approved for Public Release; Distribution is Unlimited

20000919 066

**SCHOOL OF ADVANCED MILITARY STUDIES
MONOGRAPH APPROVAL**

Major Wilson A. Shoffner

Title of Monograph: *The Military Decision Making Process - Time for a Change*

Approved by:

LTC Robert Chadwick, MMAS

Monograph Director

COL Robin P. Swan, MMAS

**Director, School of Advanced
Military Studies**

Philip J. Brookes, Ph.D.

**Director, Graduate Degree
Program**

ABSTRACT

THE MILITARY DECISION-MAKING PROCESS: TIME FOR A CHANGE

by MAJ Wilson A. Shoffner, Field Artillery, 52 pages.

The US Army's Military Decision-Making Process (MDMP) has been oft criticized as a time consuming and cumbersome process. Units typically devote so much time to developing and perfecting the plan that once the process is complete, there remains little time in which to implement it. If the time required by the MDMP were the only problem, then the solution might simply be to abbreviate or streamline the process commensurate with the time available. However, this is not the case. Even if planners are given a week, the MDMP still does not result in a "perfect" plan. In fact, recent experience at the National Training Center (NTC) indicates that despite extensive work by the staff, many plans are discarded as soon as an engagement begins. This experience is consistent with Moltke's adage "no plan survives the first shot." This author does not suggest that planning is pointless, in fact, planning is essential because it develops a thorough understanding of the problem throughout an organization. However a tactical plan is useful only if it can adapt to the dynamic nature of the battlefield. A significant shortcoming of the MDMP is that it is rigid, inflexible, and does not adapt well to "rapidly changing battlefield conditions."

This monograph asserts that this method is fundamentally inappropriate for tactical planning because it results in only one solution (the selected friendly COA) optimized against only one possible set of circumstances (enemy COA). If circumstances change, the plan becomes useless because it is not adaptable to changing conditions.

This monograph assesses the appropriateness of the MDMP for tactical planning as presented in the 1997 version of FM 101-5 and explores the utility of alternative methods and techniques. It begins by reviewing the history of the MDMP to determine the linkage between the Army's original purpose for the staff planning process and the MDMP as it exists today. The evolution of the MDMP is addressed in relation to changes in the Army at various points in time. Following the historical discussion, the way in which tactical leaders make decisions is discussed. The environment in which these future decision-makers will operate are described. This, coupled with past, current, and future limitations are used to identify the flaws inherent in the MDMP

In evaluating alternatives to the MDMP, this monograph discusses several new decision-making theories that have emerged in the last two decades, some of which appear to be appropriate for the military decision-maker. These theories include rational expectation theory, naturalist decision-making, recognition-prime decision-making, and complexity theory.

This monograph concludes that the MDMP is a poor model for tactical planning and decision making. Other decision-making models do a better job of in that they result not only in better decisions, but in flexible plans. The analytical decision-making process is only one way to make decisions; there are other ways. The Army should revise its doctrine, education and training to include other models of decision making.

TABLE OF CONTENTS

	Page
I. Introduction.....	1
II. Historical development of the MDMP.....	4
III. Shortcomings of the MDMP.....	9
IV. Tactical decision-making in the early 21st century.....	14
V. Decision theory evaluation.....	17
VI. Emerging techniques for decision-making.....	31
VII. Conclusions.....	37
VIII. Recommendations.....	40
Endnotes.....	42
Bibliography.....	47

I. INTRODUCTION

A good plan violently executed now is better than a perfect plan next week.¹

General George S. Patton

The US Army's Military Decision-Making Process (MDMP) has been oft criticized as a time consuming and cumbersome process. Units typically devote so much time to developing and perfecting the plan that once the process is complete, there remains little time in which to implement it.² If the time required by the MDMP were the only problem, then the solution might simply be to abbreviate or streamline the process commensurate with the time available. However, this is not the case. Even if planners are given a week, the MDMP still does not result in a "perfect" plan. In fact, recent experience at the National Training Center (NTC) indicates that despite extensive work by the staff, many plans are discarded as soon as an engagement begins.³ This experience is consistent with Moltke's adage "no plan survives the first shot." This author does not suggest that planning is pointless, in fact, planning is essential because it develops a thorough understanding of the problem throughout an organization. However, a tactical plan is useful only if it can adapt to the dynamic nature of the battlefield. A significant shortcoming of the MDMP is that it is rigid, inflexible, and does not adapt well to "rapidly changing battlefield conditions."⁴

The MDMP is an analytical, seven-step method and is prescribed in FM 101-5, *Staff Organization and Operations*, as the process to solve tactical problems and develop military plans. It generally results in selection of a single friendly course of action (COA) which is optimized against the most likely enemy COA.⁵ This monograph asserts

that this method is fundamentally inappropriate for tactical planning because it results in only one solution (the selected friendly COA) optimized against only one possible set of circumstances (enemy COA). If circumstances change, the plan becomes useless because it is not adaptable to changing conditions.

This monograph assesses the appropriateness of the MDMP for tactical planning as presented in the 1997 version of FM 101-5 and explores the utility of alternative methods and techniques. It begins by reviewing the history of the MDMP to determine the linkage between the Army's original purpose for the staff planning process and the MDMP as it exists today. The evolution of the MDMP is addressed in relation to changes in the Army at various points in time. Following the historical discussion, the way in which tactical leaders make decisions is discussed. The environment in which these future decision-makers will operate is described. This, coupled with past, current, and future limitations is used to identify the flaws inherent in the MDMP

In evaluating alternatives to the MDMP, this monograph discusses several new decision-making theories that have emerged in the last two decades, some of which appear to be appropriate for the military decision-maker. These theories include rational expectation theory, naturalist decision-making, recognition-prime decision-making, and complexity theory. Each theory is explained and evaluated according to the following criteria:

- (a) Does the method adequately incorporate the complexities of the battlefield?
- (b) Does the method result in timely decisions?
- (c) Does the method account for the changing nature of the battlefield?

(d) Is the method appropriate at the tactical levels?

(e) Can the method be taught?

(f) Can the method be learned?

In addition to these theories, some decision-making techniques have surfaced recently as ways to overcome the deficiencies of the MDMP. One of these techniques, decision point tactics, has received significant attention and has been successfully used by the Opposing Force (OPFOR) at the NTC.⁶ This technique is evaluated against the previously stated criteria and assessed to determine if it represents a fundamental theoretical change from the MDMP, or simply an adaptation of the MDMP to certain tactical situations. Another technique is the use of tactical decision games (TDGs) to teach decision-making. The Marine Corps, and to some extent the Armor School, have adopted this technique.⁷ TDGs are examined against the criteria stated above and reviewed to determine their utility and applicability to military decision making. Finally, Air Force Colonel (retired) John Boyd's OODA loop is be considered to determine its utility to military decision-making.

This monograph concludes with recommendations on changes to the MDMP, leader education and Army doctrine. These recommendations focus on how to make the MDMP a relevant and useful process for the military decision-maker in the early 21st century, and how to effectively inculcate the process into the officer education system.

II. HISTORICAL DEVELOPMENT OF THE MDMP

The US Army's Military Decision-Making Process was originally known as the "estimate of the situation."⁸ The first documented tactical estimate was Major General von Steuben's "Estimate of the Situation" which he prepared for General Washington prior to the attack on British forces at Stony Point, NY during the Revolutionary War.⁹ von Steuben personally performed a variety of staff functions for Washington to include reconnaissance, analysis and recommendations. This staff work was extremely valuable to Washington and reflected von Steuben's rigorous intellectual training received while serving on the staff of Frederick the Great.¹⁰

Although von Steuben made the Prussian system of staff training available to other Revolutionary Generals, few formally adopted his methods.¹¹ The result was that the Army failed to implement any formal staff system following the Revolutionary War, despite the urgings of Washington and others. In fact, when the Civil War began in 1861, the Army had essentially the same staff system that existed at the end of the Revolutionary War.¹² The Army's staff system did improve substantially during the Civil War, but little effort was made to formalize a system or process. In the years between the Civil War and the turn of the century, American military staff experience gained during the war gradually disappeared. Meanwhile, European staff doctrine was improving rapidly.¹³ Following the death of Frederick the Great, the Prussians realized how dependent they had become on the tactical genius of Frederick and decided that they needed a formal system that did not depend on a single individual or genius. The Prussians subsequently developed a documented, systematic procedure "to develop by training a high average of ability in leadership" in their staff officers.¹⁴ This system

taught officers how to conduct a "mental survey" of the existing situation and formulate a plan known as "The Decision."¹⁵

In 1901, the War Department issued General Order No. 155, which established an educational system to educate Army officers in the higher art of war. Shortly after this order was published, the School for the Application of Infantry and Cavalry at Fort Leavenworth, Kansas became the General Service and Staff College. When this school was formally opened, new methods of staff instruction had already begun. In the late 1890's, one of the instructors at Fort Leavenworth, Captain Eben Swift, introduced a course in tactical orders that included an adaptation of many of the forms used by the Prussian army.¹⁶ Swift's method required a student to study the map, arrive at an estimate and formulate a tactical decision.¹⁷ Ironically, this method was remarkably similar to the method Frederick the Great had used to instruct the young Baron von Steuben during the Seven Years' War.¹⁸ Fort Leavenworth's adaptation of the Prussian system was not unique. By the turn of the century, the Prussian Great General Staff (GGS) was highly formalized and was emulated by the armies of several other countries.¹⁹

Captain Roger S. Fitch first formally documented Swift's method at Fort Leavenworth in 1909 when he published *Estimating Tactical Situations and Publishing Field Orders*. The estimate of the situation became official US Army doctrine in 1910 when excerpts of this document were published in the Field Service Regulations.²⁰ Field Service Regulations of 1910 prescribe that "...the commander must make an estimate of the situation, culminating in a decision upon the plan of action. He must then draft or word the orders which will carry his plan into effect."²¹ From this document, the Army's decision-making process has continued to evolve over the past 90 years.

In 1932, the Army published FM 101-5, *Staff Organization and Operations*. This text described a five-paragraph commander's estimate in the following format:²²

1. Mission
2. Opposing Forces
 - a. Enemy forces
 - b. Own forces
 - c. Relative combat strength
3. Enemy Situation
 - a. Plans open to the enemy
 - b. Analysis of enemy plans
 - c. Enemy's probable intentions
4. Own Situation
 - a. Plans open to you
 - b. Analysis of plans
5. Decision

The 1932 version was significant in that it established a formal five-paragraph format. The 1940 version was revised slightly and included the following steps: mission, situation and courses of action, analysis, comparison and decision.²³ These five components remained essentially unchanged in each subsequent version of FM 101-5 to include the current 1997 version. In 1960, the process was labeled "the military decision making process" and expanded to include all the command and staff actions required to develop and execute a course of action.²⁴ The command estimate became part of an overall decision-making process. The changes in the 1960 version were significant because for the first time, the role of the staff was articulated by doctrine. The 1968 version revised the process by framing battlefield decisions in terms of an analytical problem-solving methodology that consisted of five sequential steps: 1) statement of the

problem; 2) collecting data; 3) developing possible solutions; 4) analyzing possible solutions; 5) selecting the best solution. Interestingly, the 1968 version states that this format is not rigid and that the estimator could skip steps or abbreviate the process as appropriate.²⁵ Like the 1960 version, the 1968 version placed greater emphasis on the role of the staff than had previous versions.

In 1977, a version of FM 101-5 was released which represented an unprecedented shift from previous versions. This release described the process as "dynamic, subjective and hurried" and viewed the analytical decision making process as presented in the 1968 version as useful primarily as a "training aid."²⁶ This version viewed the estimate as a natural process, most of which would occur in the mind of the commander, but the manual did little to describe this "natural" decision-making. This ambiguity was soon resolved when the Army published a new version of FM 101-5 in 1982, which represented essentially a complete shift back to the deliberate MDMP presented in the 1968 version.

The 1997 version of FM 101-5 differed significantly from previous versions because it acknowledged that the deliberate analytical decision making process might not fit all situations. It advocated an abbreviated decision making process to be used for time-compressed situations, but did little to explain how the process was to be abbreviated. This version makes it clear that the US Army acknowledges only one method of military decision-making, that being the deliberate, analytical method. "There is still only one process, however, and omitting steps of the MDMP is not the solution."²⁷

The MDMP evolved from the first documented tactical estimate in the Revolutionary War, through the inclusion of five basic components of "the estimate" and

inclusion of staff actions to the present 1997 version of FM 101-5. Throughout this process, the fundamental characteristics of the MDMP did not change. What has changed is that it has become a laborious process of deliberate planning requiring vast amounts of time in preparation and results in a product, which is of questionable value to the commander.

III. Shortcomings of the MDMP

It is time to admit that the theories and ideals of decision making we have held over the past 25 years are inadequate and misleading, having produced unused decision aids, ineffective decision training programs and inappropriate doctrine. The Department of Defense often follows the lead of behavioral scientists, so it is important to alert DOD policy makers to new developments in models of decision making.²⁸

Dr. Gary Klein wrote this admonition more than ten years ago. Unfortunately, the Army has done little to revise the MDMP despite Klein's urgings and the results of other studies.²⁹ The 1997 version of FM 101-5 acknowledged that the deliberate (analytical) decision making process might not fit all situations, but failed to present alternative methods for the process. As this manual states, "The MDMP is a sound and proven process that must be modified with slightly different techniques to be effective when time is limited. There is still only one process, however, and omitting steps of the MDMP is not the solution."³⁰ Klein argues that the MDMP does not work because it takes too long, but even in situations when there is enough time, the MDMP still fails because it "...lacks the flexibility for handling rapidly changing battlefield conditions."³¹

In an article for the *Marine Corps Gazette*, Major John Schmitt described how a deliberate decision-making process might be appropriate for selecting a car to purchase, but inadequate for military situations.³² The car-buying process Schmitt describes is essentially a multi-attribute decision-making process whereby the would-be buyer collects all relevant empirical data on the various cars he is considering and then evaluates each car against criteria he has established as important to him. In this way, the car that best meets the defined criteria is chosen. Multi-attribute decision-making is a useful tool for making decisions between possible options when sufficient information is

available describing each option. It is easy to envision how this method might not work for a tactical situation where information about the enemy (or friendly) situation is incomplete. Tactical situations are also often very dynamic and the multi-attribute method fails again because it does not account for changing information nor does it account for the fog of uncertainty which exists on the battlefield. Furthermore, the Army's deliberate decision making process effectively compares only one friendly COA (the chosen COA) against only one possible enemy COA (the most likely enemy COA).

If the deliberate decision-making process were followed in an unconstrained environment, each possible friendly course of action would be compared (wargamed) against each possible enemy course of action. To do this would require the development of a tremendous number of situations, all of which would be wargamed and compared against established criteria. Suppose a given situation in which there are five possible friendly COAs and four possible enemy COAs. This would result in a total of twenty situations to be developed and wargamed. Obviously, no tactical staff has the time to sufficiently evaluate this many situations. There may be more than one friendly COA appropriate for a given situation, while at the same time multiple enemy COAs which could be considered. In an unconstrained environment, the MDMP calls for wargaming each friendly COA against each enemy COA. However, whenever one course of action (the one chosen by the commander) is compared against only one enemy course of action (the one the S-2 identifies as most likely), many possibilities are discarded. In the situation described above, the plan is built around only one of the twenty possible combinations while the remaining nineteen are discarded. At the Army's National Training Center (NTC) this inherent flaw causes a recurrent problem. "NTC experiences

are replete with examples where the staff has consumed the majority of the planning time on courses of action that are suddenly discarded by the commander, based on information either neglected or unknown by the staff prior to the decision briefing."³³

In the days of von Steuben and even in the days of Eben Swift, the estimate of the situation was nothing more than a quick assessment given to the commander to aid in his decision-making. The commander would synthesize this information and make a decision *intuitively* based on his accumulated knowledge and past experiences. Hence, before the deliberate decision-making process came into fruition, commanders effectively practiced intuitive decision-making.

What the MDMP fails to incorporate is that there are essentially two decision-making processes undertaken by the tactical commander. The first process is accomplished by the commander during the planning of an operation and results in the selection of the optimum course of action for the given situation. Simply stated, the commander chooses how he wants to fight. The second decision process occurs during the execution of the plan, whereby the commander adjusts the plan based on enemy actions or the receipt of information of the enemy's disposition or intentions. The MDMP focuses almost completely on making the first of these two decisions and does little to aid the commander in making the critical decisions during the execution of the mission.

In the military decision-making process today, the focus of the process is on selecting a COA versus producing a complete plan. The very title of the process suggests that *decision-making* (course of action selection) is the purpose of the effort. This is an inherent flaw of the MDMP. A senior Army commander described this as a case where "...the process becomes the object." The focus of the staff should be formulating a

workable plan that identifies critical decision points, not the decision to choose a COA.³⁴ What often happens is that the staff spends the vast majority of the available time focusing on course of action development and selection such that by the time a decision is made (COA selected), there is relatively little time remaining to fully develop the plan. The result is a plan without contingency plans (branches) or follow-on actions (sequels). During the execution of the plan it often becomes evident that the enemy is acting in a manner inconsistent with the most likely enemy course of action, which the friendly plan is built around, and the friendly plan has no contingency plans to deal with unexpected enemy actions. As von Moltke said, "You will usually find that the enemy has three courses open to him, and of these he will adopt the fourth."³⁵

Given that FM 101-5 focuses on course of action development and selection, but gives little attention to the development of branches and sequels, this is not surprising. To further compound the problem, FM 101-5 includes a discussion of a tool known as the synchronization matrix and even includes a pull-out example. While admittedly a useful tool for synchronizing complex actions, the synchronization matrix is often the focus of the planning effort. The "process [MDMP] emphasizes detailed evaluation of options with a goal to provide explicit instructions to synchronize the force."³⁶ The result is a highly synchronized, but completely inflexible plan. There are serious limitations in building a synchronization matrix to model a dynamic tactical situation. Tactical situations are multi-dimensional while the synchronization matrix is "...limited by the available dimensions of a flat sheet of paper."³⁷ Interestingly, some of the planning tools available for anticipating contingencies and reacting accordingly, namely the decision support matrix (DSM) and decision support template (DST), were included in the now

out of print Student Text (ST) 100-9, *The Tactical Decisionmaking Process*. ST 100-9 presented the DSM and DST as integral steps in developing the plan, but in the current FM 101-5 these documents are essentially buried deep in the manual in Appendix K.

IV. The Decision-Making Environment of the 21st Century

In an article for *Armor Magazine*, Lieutenant Colonel John Antal posits that the Army may be entering the 21st century "...wedded to an industrial age decision-making process."³⁸ In fact, the Army's recent Advanced Warfighter Experiments (AWEs) show that simply having more information available merely "...saturates the human decision-making system and freezes action."³⁹ Before we can attempt to describe decision-making in the 21st century, we must first understand this future environment. This chapter will present the views of several decision-making theorists on what we can expect this environment to be in the next century.

It is easy to describe the future by using adjectives and phrases that sound appropriate, yet defy description. An example is the Army Digitization Master Plan (ADMP) which attempts to implement innovative concepts. The purpose of the ADMP is to "...leverage information technology to rapidly mass the effects of dispersed firepower..."⁴⁰ The ADMP predicts that the future digitized battlefield will have characteristics such as: a common picture of battlespace in near-real time; shared data; high speed data exchange; fusion and display of intelligence; and rapid exchange of targeting data from sensor to shooter.⁴¹ While no one will argue that these are desired attributes of future systems, these descriptors are of little utility to those who will operate in the future environment unless they enable the decision-maker or the effectiveness of the force.

Outside the Army, there is little consensus on what exactly these characteristics will be. In 1996, the US Army War College held a workshop to discuss decision-making in the 21st century. The workshop included 35 participants from academia, business and

the military. The group's first charter was to describe the decision-making requirements of the 21st century. Although the group did not decide on specific characteristics of the future environment, the consensus was that "The environment a strategic leader will be operating in will be characterized by a number of features."⁴² The group saw future organizations as technologically complex both structurally and interactively. One notion that all agreed upon was that the future will be characterized by greater ambiguity, uncertainty, and less predictability as the future bears less resemblance to the past. As one group member put it, "The future portrays a world in which rationality might be dysfunctional."⁴³ Considering the US Army's involvement in the 1990s, it is easy to embrace this concept of the future since the types of operations the Army faced in the '90s were significantly different from those it faced in the 70s and 80s.

The Army War College group agreed that military decision-makers will find themselves increasingly in global situations. Coalition operations will be more prevalent which will require leaders to operate in cultures vastly different from their own. Media focus and accountability will increase and ad hoc organizations will be more prevalent. These organizations will come together and split as soon as their useful association ends. The leaders in this environment will be confronted with decisions that have to be made at a much higher rate than in their training environment. Cognitive flexibility is seen as critical. The author of *Future Shock*, Alvin Toffler, echoes this theme of rapid information flow: "We call that 'Future Shock' - - when too much change hits too fast for people to absorb, they began to show signs of either deteriorated decision-making capability or disorientation; indeed, in some cases, stress and illness and so forth."⁴⁴

In the Army's Division AWE in 1997, situations evolved with the same characteristics as those the Army War College study predicted. During this exercise, an Independent Motorized Rifle Brigade (IMRB) entered the division's area of operations. Equipped with the latest in technological surveillance, the Unmanned Aerial Vehicle (UAV), the division was well prepared to react to the unexpected incursion. The UAVs quickly moved to the appropriate site and transmitted real-time video to the Division's Tactical Operations Center (TOC). The staff reacted immediately and rapidly focused resources to affect the problem. As it was, the IMRB posed no significant threat to the division. Yet the division had placed its entire focus on the IMRB and had diverted critical resources away from the main effort. In the after action review (AAR), this event was seen as "...a case where excellent situational awareness actually degraded planning and decision-making."⁴⁵

V. Decision Theory Evaluation

Decision Theories Described

This monograph will examine several contemporary theories and models to determine their applicability to military decision making. Many academics and social scientist have written on the subject of decision-making and in some cases, several different labels are used to name essentially the same theory or model. This monograph will examine the following theories/models: rational expectation or analytical decision making theory; action based or natural decision making; intuitive or recognition-primed decision-making (also known as bounded/limited expectation theory); rule based decision making; and complexity theory.

Classic, Analytical Decision Making

This theory is also referred to as rational expectation theory, but for the purposes of this monograph will be referred to as analytical decision making. This theory pursues a logic of consequence and is based on a decision process, which is consequential and preference-based.⁴⁶ It is consequential in that a decision is made based on the expected consequence of current actions. It is preference-based in that all possible consequences are examined and evaluated in terms of the decision-maker's preferences. In using this theory, the decision-maker makes a conditional decision based on the answers to four basic questions:⁴⁷

1. The question of *alternatives*: What actions are possible?

2. The question of *expectations*: What future consequences might follow from each alternative? How likely is each possible consequence, assuming that alternative is chosen?

3. The question of *preferences*: How valuable (to the decision maker) are the consequences associated with each of the alternatives?

4. The question of the *decision rule*: How is a choice to be made among the alternatives in terms of the values of their consequences?

The Army's MDMP fits this analytical model. The steps of the MDMP as shown below correspond to the four questions of the rational expectation model:⁴⁸

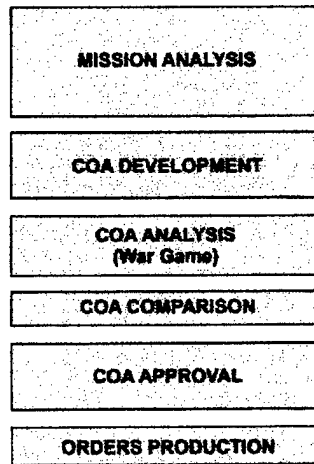


Figure 1: Steps of the MDMP

In the COA development phase, the staff develops all possible *alternatives* (question 1).

In the war-gaming phase of COA analysis, the staff answers the question of *preferences* (question 3) by assigning an empirical value to the consequences identified in accordance

with the guidance received from the commander. The commander satisfies the *decision rule* (question 4) by selecting a COA from the alternatives in terms of the value of their expected consequences.

Chapter III discussed many of the shortcomings of the MDMP and this model in application for military decision making. As previously noted, this model does a poor job of adequately incorporating the complexities of the battlefield. Because it is a sequential method, the MDMP encourages linear thinking rather than the more holistic practice of complexity thinking. "...instead of considering all alternatives, decision makers typically appear to consider only a few and to look at them sequentially rather than simultaneously."⁴⁹ Furthermore, "Decision makers do not consider all consequences of their alternatives. They focus on some and ignore others. Relevant information about consequences is not sought, and available information is often not used."⁵⁰ Again, the nature of the process is the culprit. Because of its reductionist nature, the MDMP results in a focus on a single course of action and often ignores other courses of action that may be or may become relevant.

Besides failing to adequately incorporate tactical complexities, this method's greatest weakness is that it simply takes too much time. "As a formal, systematic, and logical process, the Estimate typically demands more time to perform the process than is afforded by the situation."⁵¹ In fact, many commanders realize that the process consumes a tremendous amount of time and abandon the process altogether. In a 1990 study of the Battle Command Training Program (BCTP), one commander stated that he did not believe in the doctrinal process and refused to use it, because he believed that the process was too formal and would consume too much time.⁵² In situations where a staff

abbreviates the process, the result (final plan) still is insufficient. A 1991 study of BCTP noted that "...there were no common procedures for abbreviating the Estimate. The staff just left out whatever was convenient...or too hard to do."⁵³

Another common complaint of the analytical decision-making process is its inflexibility. This method is simply ill-suited to account for the changing nature of the battlefield. That the analytical model does not offer the flexibility for tactical situations is not a new discovery. In 1973, Olmstead Chistensen and Lackey commented on the importance of flexibility in an organizational process:

The ability of an organization to respond flexibly to changes in its operational environments is related to its Competence....In many organizations, Competence is less than adequate because little systematic attention is given to the quality of process execution. Instead, attempts to improve effectiveness take the form of increased emphasis upon regulated and formal responses that control variability and, thus, insure reliability in performance....However, over-reliance upon standardized responses leads to organizational rigidity.⁵⁴

Following an exercise at the Command and General Staff College (CGSC), a student who had acted as the Division Chief of Staff observed that "Procedures for the estimate are not specified for how to deal with changes in status or mission...it is not clear how to proceed when situation and mission changes occur."⁵⁵ Admittedly, this student's statement is not entirely accurate. Procedures for dealing with "changes in status or mission" are included in FM 101-5 in the form of the DST and DSM. CONPLANS and Fragmentary Orders (FRAGOs) exist for such situations. The student's perception, however, underscores a critical failure of the MDMP as it is taught and as it is practiced - - the process results in a plan that is not adaptable to the changing nature of the battlefield.

The US Army has taught essentially the same, analytical decision-making process for several decades. One of the advantages of this model is that it can be taught easily. The sequential, methodical and logical nature of the process makes it appealing for classroom instruction. Despite the apparent ease in teaching the process, there is evidence that not all students are learning it as they should. Examples abound in which tactical staffs failed to follow the procedures as outlined in the MDMP. A 1990 study by the Center for Army Lessons Learned (CALL) examined three missions by a battalion task force and noted that the staff never used the decision making process.⁵⁶ A 1992 study of Combat Training Centers (CTCs) found that 76 percent of staffs did not conduct parallel planning.⁵⁷ Another study revealed that given the absence of detailed guidance, staffs did not follow the MDMP. In these cases, the staff omitted steps, performed less analytically and "vacillated" among steps.⁵⁸

Action Based (Naturalistic) Decision-Making

This model assumes that the classical, analytical method is inappropriate because there are decisions that must be made in the current, or natural, environment that does not resemble the past.⁵⁹ The model encourages bold action and is forgiving of mistakes. Mistakes are acceptable as long as they are learned from and are seen as a normal part of an evolving process where the decision-maker is constantly learning. The decision-maker is encouraged to apply creative, innovative solutions that do not fit established models.

In the early 1970s, cognitive psychologists labeled this method "naturalistic decision-making."⁶⁰ Naturalistic decision-making differs from analytical methods

because it portrays decisions with respect to their natural environment. This environment is characterized by:⁶¹

- Ill-structured, situation unique problems.
- Uncertain, dynamic environments.
- Shifting, ill-defined or competing goals.
- Lack of information.
- Ongoing action with continuous feedback loops.
- High levels of stress and friction.
- Lack of time.

The action model is ideally suited for the ambiguous, complex situation a commander might encounter on the battlefield. In fact, the environment described above is very similar to the environment most expect for the tactical decision-maker of the 21st century. The model assumes that chaos is not bad, but rather leads to opportunity and creativity.⁶²

An assumption inherent in this model is that the decision-maker does not have sufficient time for analytical methods. Although decisions may later prove to be incorrect, or at least sub-optimal, decisions are made rapidly.

The action model facilitates understanding change on the battlefield. Rather than collecting information on changes, the model seeks to understand the environment as a whole and changes, as they occur, add to this understanding.

Because this model encourages learning from mistakes, it may not be appropriate for all tactical levels. If mistakes were to be made at a high tactical echelon, such as a division level operation, the results could be disastrous. At lower tactical levels, the same mistakes, while not desirable, might be acceptable. Given current US Army culture, a leader who attempts an innovative solution, breaks from doctrine, and fails might be strongly discouraged from further attempts.

A significant drawback to this method is that it would be difficult to teach. The model is not widely understood or accepted by other organizations or cultures, particularly the military.⁶³

Bounded/Limited Rationality Theory

The idea behind limited rationality theory is that individual decision-makers are rational. Despite the best intentions of those that follow the analytical model, the realities of incomplete information and an inability to visualize possible consequences actually result in decisions that prove less than rational.⁶⁴ Whereas the analytical decision-maker attempts to make an optimum decision based on analysis of available data, the limited rationality decision-maker seeks to satisfice by quickly choosing a course of action that exceeds some criterion or target.⁶⁵ The limited rationality type makes heuristic decisions by recognizing patterns in situations they face and applying rules of behavior appropriate for those situations.⁶⁶ An example of this type of thought is the champion chess player. The chess player's genius is his ability to recognize a variety of situations and recall from memory the appropriate action.⁶⁷

Dr. Gary Klein, one of the foremost experts in applied cognitive psychology, calls this pattern-recognition type of decision making recognition primed decision-making

(RPD). Klein spent years studying experienced decision-makers to include military commanders, urban fireground commanders, wildland fireground commanders, computer programmers, paramedics and others to learn how these individuals made decisions.⁶⁸ Klein concluded that these experienced decision-makers rarely, if ever, used the analytical method of decision-making, but instead applied the recognitional method.⁶⁹ "Decision-makers in a variety of fields use the analytical approach to decision-making less than 10 percent of the time and employ intuitive techniques over 90 percent of the time."⁷⁰ According to a senior Army commander, good commanders use intuitive decision making techniques automatically. Most commanders go through a logical process to internally eliminate courses of action...then decide within the time available.

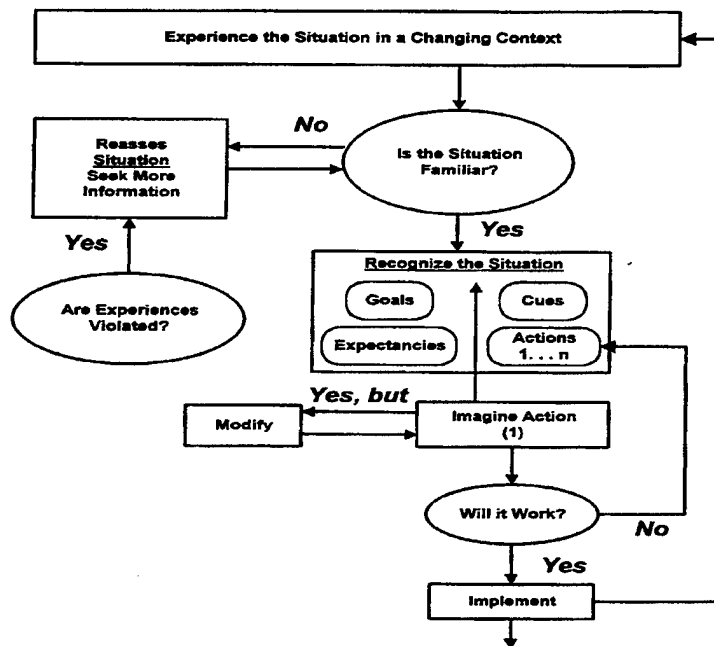


Figure 2: Recognition Primed Decision Model

In analyzing the limited rationality model, it becomes clear that one of the weaknesses of the model in military applications is that it does not necessarily incorporate all of the complexities of the battlefield. Especially in highly complex situations requiring detailed planning, the intuitive method is inadequate.⁷¹

The great advantage of the limited rationality approach for tactical situations is that it requires very little time. In fact, in over 85 percent of cases that Klein studied, the decisions were made in less than one minute.⁷²

Another advantage of this method is that it is immediately responsive to changing battlefield conditions. Because there is no need for detailed comparative analysis, decisions can be made rapidly based on available information. In a tactical situation, a limited rationality decision-maker might make a series of decisions, based on battlefield information as it becomes available. The risk inherent in this method is that if the decision-maker (the commander) is inexperienced, he may lack the background for sound intuitive judgments.⁷³

As previously stated, this method is inappropriate for highly complex environments requiring significant computations and detail. Certainly, planning at levels above the tactical such as Corps or Joint Task Force (JTF) require more analysis and comparison of alternative than the tactical level. In the same sense, in certain tactical situations the limited rationality method may be inappropriate. One such scenario might be a US Army division acting as a JTF headquarters.

Arguably, the most difficult aspect of the limited rationality method is teaching it to decision-makers. Unlike the analytical method that avails itself to classroom instruction, the limited rationality method is based on intuitive decision-makers and it is

difficult to teach a student to become intuitive. Intuition is developed through experience. Experienced commanders often make intuitive decisions without even realizing it. Dr. Klein encountered one such commander who stated that he never made any decisions. "What he meant was that he never constructed two or more options and then struggled to choose the best one. After interviewing him, we learned that he made decisions all the time."⁷⁴

The Marines use a technique to teach intuitive decision-making known as the tactical decision game (TDG).⁷⁵ In a TDG, a student is presented with a tactical situation and given a finite amount of time to develop a plan. He is then required to brief his plan to the class and justify his actions. In order to be effective, the student must encounter TDGs repetitively in order to build his experience base. Another method to build the tactical experience base is the study of past campaigns and battles from the perspective of the decision-maker.

Rule Based Decision-Making

In rule based decision-making, the decision-maker attempts to understand a given situation, then applies whatever solution is appropriate to the problem. The reasoning process is one of establishing identities and matching rules to recognized situations.⁷⁶ The rule-based decision-maker asks himself (either implicitly or explicitly) three questions:⁷⁷

1. The question of *recognition*: What kind of situation is this?
2. The question of *identity*: What kind of person am I? Or what kind of organization is this?

3. The question of *rules*: What does a person such as I, or an organization such as this, do in a situation such as this?

This model appears to have utility for the tactical decision-maker, especially at lower tactical levels. If the decision-maker is highly experienced, his actions may be very similar to those he would choose in following the limited rationality model. Like the limited rationality model, the rule-based model does not necessarily ensure that all battlefield complexities are considered. The level of complexity involved in the decision is largely a product of the decision-maker's experiences.

The second step of this model, the question of identity, is an unnecessary step for the tactical decision-maker. The tactical commander fully understands who he is and what kind of organization he is a part of. These questions are answered long before the decision-maker arrives on the battlefield. At echelons above the tactical, such as a JTF where roles and responsibilities are less defined, this step is absolutely essential in the early stages of planning.

The third step of the model is directly relevant at the lower tactical levels. The battle drills that the army teaches to sections, crews and platoons follow this model. An example is the "actions on contact" that an Infantry squad would perform when encountering an enemy. Another example is the action a tank crew takes once they have identified an enemy target. In this example, the tank commander (TC) answers the question of recognition by identifying a suspected enemy vehicle as an enemy vehicle and by determining what type of enemy vehicle it is, such as an enemy tank. The question of identity is omitted in this case because the gunner already knows who he is. The TC answers the rule question by determining that the gunner should fire upon the

enemy tank and do so with a certain munition appropriate for the target. In this case, the TC would answer the rule question in a second or less and quickly give the fire order to the gunner. The entire drill is complete in only a few seconds:

TC: "Gunner, Sabot, Tank!"

Gunner: "Identified!"

Loader: "Up!" (meaning the round is in the breech and the gun is armed)

TC: "Fire!"

Gunner: "On the way!"

TC: Target! "Cease fire."

Because this model is sequential, logical and relatively simple, it could be easily taught in a classroom environment. The US Army's battle drills are evidence of this.

Despite its relevance during the execution phase for lower tactical levels, the rule-based model is less applicable as a planning model. Because the rule-based model does not account for the complexity ever-present on the modern battlefield, it is a poor model for tactical planning. Other models do exist which aid the decision-maker in dealing with the fog and uncertainty produced by the complex nature of the battlefield.

Complexity Theory

Complexity theory is based on the premise that human interaction is like a biological organism, composed of simple elements but is an extremely complex system as a whole. The system is complex in that a "great many independent agents" interact with each other in many ways.⁷⁸ This system - be it an individual, a species, a corporation or industry - is also adaptive to its environment. In his book, *Complexity*, Michael Waldrop describes the notion: "...complex systems have somehow acquired the

ability to bring order and chaos into a special kind of balance. This balance point - often called the *edge of chaos* - is where the components of a system never quite lock into place, and yet never quite dissolve into turbulence, either."⁷⁹

More than any other model, complexity theory most closely accounts for the complexities of the modern battlefield. In fact, Waldrop uses a military analogy to describe the concept. "The edge of chaos is the constantly shifting battle zone between stagnation and anarchy...."⁸⁰ Complexity theory looks for order or understanding in situations that appear chaotic, much as a commander tries to make sense and understand the turbulence of the battlefield.

Although complexity theory adequately describes the complex nature of the battlefield, it is not a prescriptive decision-making method. Rather, complexity theory helps the decision-maker understand complex situations and react accordingly. The timeliness of decisions based on complexity theory is a function of the cognitive abilities of the commander.

The complexity model is useful in attempting to understand the changing nature of the battlefield. Complexity theory holds that top-down rule-based systems are ineffective in predicting situations because it is simply impossible to imagine every conceivable situation.⁸¹ Top-down systems inevitably run into combinations of events they do not know how to handle and eventually "...grind to a halt in a dither or indecision."⁸²

By its very nature, complexity theory would be a difficult subject to convey in a classroom environment as a decision-making model. Instead of a linear, logical method

that can be ingrained and applied to future situations, it involves a way of thinking about systems. There are no general procedures to be followed, no checklists to be memorized.

VI. Emerging Techniques for Decision-Making

While not theories in their own right, three decision-making techniques have emerged in recent years: decision point tactics (DPT), the OODA loop and tactical decision games. This chapter will explore the utility of these techniques and their applicability for the 21st century decision-maker.

Decision Point Tactics

The concept of decision point tactics was developed by the OPFOR at the NTC. The process was developed through experimentation and trial and error in engagements with rotational units or blue forces (BLUEFOR).⁸³ As defined by the OPFOR, decision point tactics

*is the art and science of employing available means at a specific point in space and/or time where the commander anticipates making a decision concerning a specific friendly course of action. This decision is directly associated with threat force activity (action/reaction) and/or the battlefield environment.*⁸⁴

The author of decision-point tactics, LTC Pete Palmer, claims that "the basic concept and technique of using decision points is embodied in our current Army doctrine."⁸⁵ LTC Palmer is right - - decision point tactics is nothing new. It is essentially an application of a DST to the NTC terrain. However, as was previously mentioned in Chapter III, current US Army doctrine, namely FM 101-5, does not present the DST as an integral part of the MDMP. A graphic depiction of decision point tactics reveals that it is conceptually the same as the decision support template as shown in ST 100-9 and in described in Appendix K of FM 101-5.

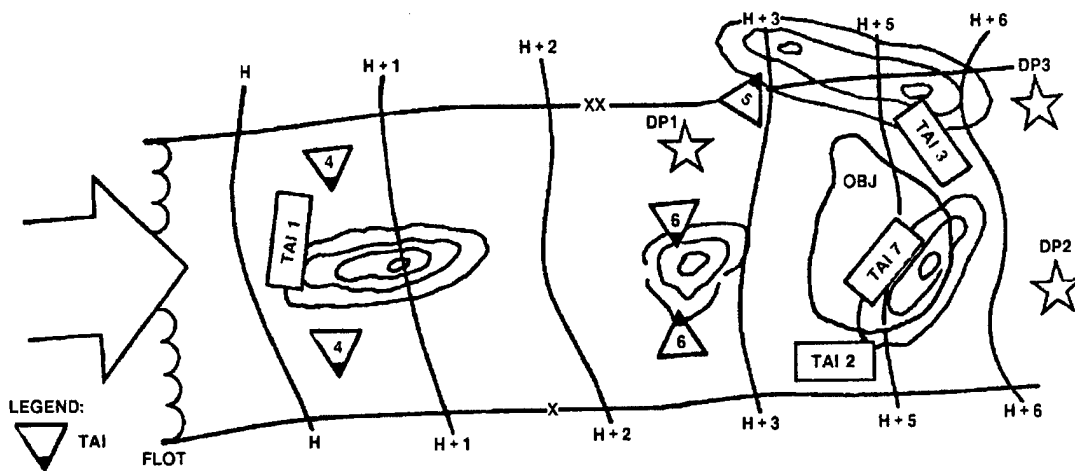


Figure 3: Decision Support Template (ST 100-9)

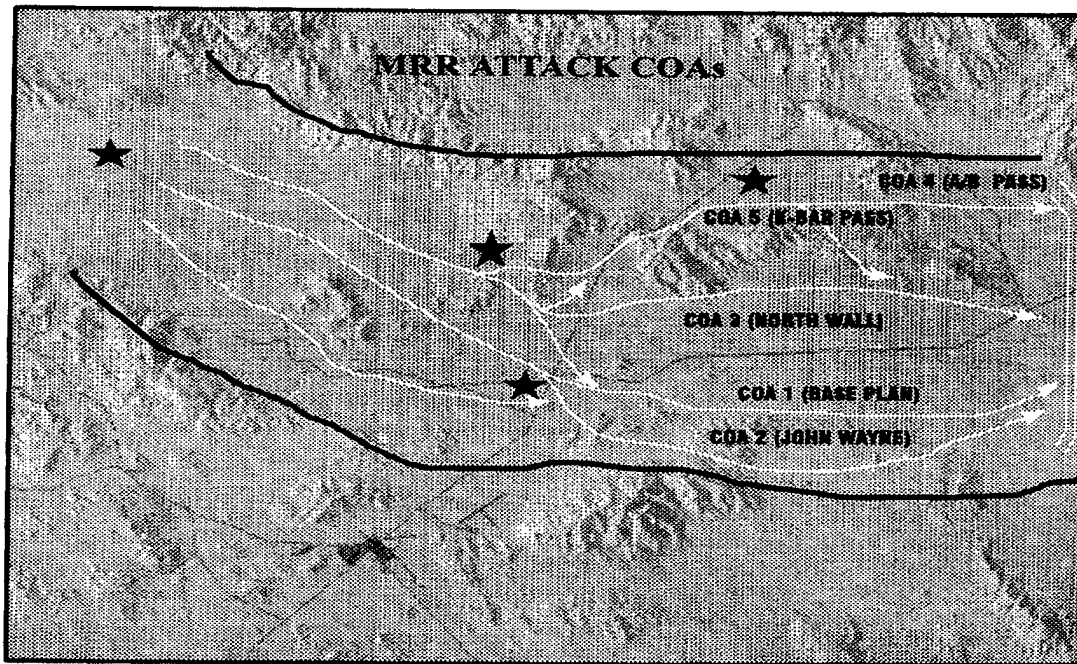


Figure 4: Decision Point Tactics
(stars represent Decision Points)

LTC Palmer states that decision point tactics developed because as the OPFOR began training at the NTC "...it quickly became apparent that the old way of doing business would no longer work."⁸⁶ Palmer's remarks refer to an inherent flaw in the MDMP - that it is ineffective in adapting to the changing nature of the battlefield. As stated previously in this monograph, the MDMP neglects the decisions made during the execution of a plan. Decision point tactics evolved as a means to overcome this deficiency. It allows a unit to adapt from a base plan into one of several possible COAs. These possible COAs may be the ones developed, but not chosen, during the course of action development phase, or they may become evident during the wargaming phase of course of action analysis. During wargaming, if it becomes apparent that the base plan is inadequate to deal with possible enemy actions (other than the most likely enemy COA), then contingency plans (CONPLANS) are developed for these contingencies. Having a plan that is flexible and adaptable is inherently tactically sound. Napoleon had such a plan during the Ulm campaign when he marched east, uncertain of Austrian and Russian dispositions. He kept his corps close enough to one another to be mutually supportive and react to unexpected enemy actions.⁸⁷ Once he knew that Kutosov and the Russian army were too far east to support the Austrians, he committed his main body against the Austrian army at Ulm. Napoleon had effectively crossed a key decision-point.

Decision point tactics meets all of the criteria examined for this monograph. Because DPT anticipates uncertainty and an incomplete picture of the enemy, the method does a much better job of accounting for battlefield complexities than does the MDMP. It results in more timely decisions because battlefield decisions are thought about long before they are made and do not come as a surprise. The method accounts for the

changing nature of the battlefield because at any time during the execution of a plan the commander has many choices open to him. The method has been used successfully at the battalion and regimental level and could conceivably be applied at any tactical level. Palmer's pamphlet "Decision Point Tactics" is an excellent primer on the technique, but focuses solely on the desert environment unique to the NTC.

Decision Point Tactics is more than just a technique to overcome the deficiencies inherent in the MDMP. It involves aspects of deliberate, analytical decision-making, limited-rationality or intuitive decision-making and rule based decision-making. The planning process for DPT begins the same as the traditional MDMP, but is different in that only a single base COA is identified. The focus of the staff then shifts to identifying contingencies to the base COA based on multiple possible enemy COAs - - not just the most likely enemy COA. During the execution of the plan, the commander practices either rule-based decision-making or intuitive decision-making. If the enemy follows an identifiable pattern that calls for a particular friendly COA, then the commander has effectively applied the rule-based model. If the situation is vague or unclear, the commander must rely upon his intuition and choose the contingency plan that he feels is appropriate for the situation.

Tactical Decision Games

Tactical decision games (TDG) are not so much a decision-making model as they are a technique for teaching intuitive decision-making. The method for using TDGs in a classroom environment was described in Chapter 5. As an inexpensive tool for building the experience base of students, without subjecting them to actual combat, TDG are quite useful. As with any other "wargame" or simulation, TDGs cannot accurately incorporate

all the complexities in existence on the battlefield. Similarly, TDGs do not account for the changing nature of the battlefield because they are based on a static or snapshot enemy picture. The student must visualize how the enemy picture might change and must plan accordingly. This visualization, however, is quite valuable and is a time-proven method for understanding a tactical problem. Captain Eben Swift's "estimate of the situation" drill of the 1890s was a very similar process.⁸⁸

The OODA Loop

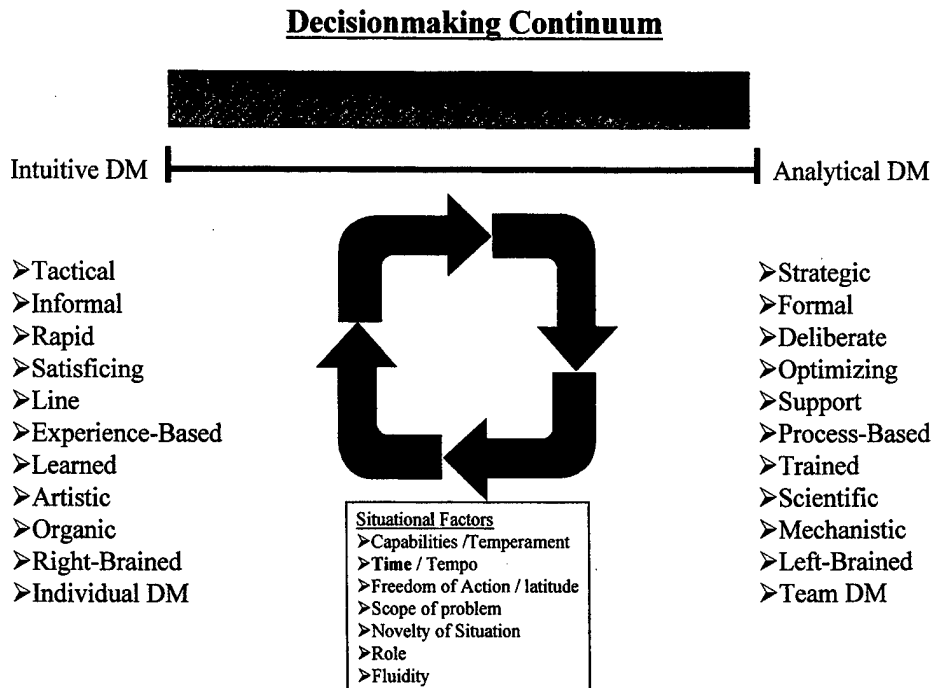
While the OODA loop is not a new concept, it has resurfaced recently as a potential model for military decision making. The OODA Loop was developed in the 1950s by US Air Force Colonel John Boyd, based on his experiences as a fighter pilot in the Korean War. Boyd found that US pilots, although flying technologically inferior aircraft, repeatedly shot down advanced Soviet Migs. Boyd postulated that because the controls in the US jets were more responsive to pilot input than the Soviet Migs, the US pilots could react and engage the Migs before the Migs could react. The letters in the model stand for: Observe, Orient, Decide, Act. Boyd held that this process modeled the actions of the fighter pilot in combat and could be used to model other combat decisions as well.

Dr Gary Klein sees the OODA loop as related to intuitive decision making. "...it encourages intuition, it encourages sizing up the situation and reacting in accordance with learned patterns, as opposed to painstaking analysis."⁸⁹ In that it involves reacting to a learned pattern, the OODA loop includes some of the attributes of rule-based decision-making as well.

Klein believes, however, that the OODA loop should not be taught as a prescriptive model, because expertise in decision-making comes from experience - not from following a model.⁹⁰ The OODA loop may be useful, though, in explaining how leaders make decisions. Its limitations are that it cannot be applied to complex military scenarios. It is a linear model involving only one decision-maker.

VII. Conclusions

One of the groups in the 1996 Army War College study viewed military decision making as a continuum between the intuitive and analytical processes. This model acknowledges that in some situations, intuitive methods of decision-making are appropriate, while in others, the analytical method is appropriate. There may be other situations that require both methods of decision-making or combinations of both.



Which model is correct?

The bottom line for the Army is that the MDMP is a poor model for tactical planning and decision making. Evidence from the field underscores this conclusion. The MDMP simply requires too much time and lacks the flexibility to "handle" rapidly changing battlefield conditions.⁹¹ Other decision-making models do a better job of in that

they result not only in better decisions, but also in flexible plans. The analytical decision-making process is only one way to make decisions; there are other ways.

There is no single best solution for military decision-making. Of the models examined in this monograph, all have applicability for the tactical decision-maker. As the preceding chart indicates, the situation dictates whether the intuitive or analytical method is appropriate. Because of their characteristics, most tactical situations fall on the left side of this spectrum.

It is important to distinguish those decisions made during the planning process (COA selection) from those made during the execution of a plan. As stated in Chapter III, the MDMP focuses almost exclusively on those made during planning. Most tactical staffs spend the majority of their time developing a plan with little regard for contingencies. Consequently, during the execution of the plan, the commander is often ill-prepared for decisions concerning contingencies. In light of the requirement for different types of decisions, different decision models may be appropriate. The deliberate, analytical model is more likely the one to be used in determining the initial plan to follow, while the limited rationality (intuitive) method or rule-based method may be appropriate for the execution phase of an operation. For the plan to be effective, it must include all appropriate decision processes.

Complexity theory is useful for tactical planners because it aids in understanding how complex systems work. Unlike analytical models, which became popular in the 1960s and 1970s, complexity theory is a better model for describing tactical situations because it does not over-simplify the issue. Because analytical models do not and cannot account for the intangible realities of warfare, they do a poor job of representing the

issues a decision-maker must consider. Admittedly, complexity theory is not an easy concept to grasp, but neither are the intricacies of combat.

Our focus is wrong

Studies that have examined tactical planning all agree that US Army planning staffs focus too much on making a decision (selecting a COA) and not enough time writing a coherent, well-developed plan which is flexible and adaptable. As one senior Army commander said, "The [Military Decision Making] Process has become the object." In focusing our planning efforts on COA selection, staffs tend to omit essential steps, particularly the development of contingency plans. Consequently, our plans often fail because they are rigid and inflexible and do not have well-developed contingencies. Decision point tactics evolved because of the inflexibility of the MDMP. Those that do some of the most tactical planning, the OPFOR at NTC, developed DPT as a technique to overcome this deficiency.

VIII. Recommendations

We must hold our minds alert and receptive to the application of unglimped methods and weapons. The next war will be won in the future, not in the past. We must go on, or we will go under.

General of the Army Douglas A. MacArthur

Doctrine

It is time to revise FM 101-5. A better name for the Army's planning process would be "The Tactical Planning Process" (TPP) instead of the MDMP. Naming the process such would be consistent with the purpose of planning efforts; to produce a plan that works.

The deliberate, analytical decision-making process does have some utility for tactical planners. It should be retained in FM 101-5, but only as one of the tools for decision-making, not the only tool. Intuitive methods such as recognition primed decision-making should be included in the manual. Proven techniques, such as decision point tactics, should be included as well.

Education

As we revise our doctrine, we must change the way we teach it to future decision-makers and planners. A paradigm shift is required in the way the Army views decision-making. The focus of professional military education should be on developing "capable decision makers who can operate under any future circumstances."⁹² The goal of the process would be to "grow" decision-makers through education and practical experience.⁹³ Unfortunately, the Army's current education system does a poor job of teaching planning and decision-making. In an article for *Joint Forces Quarterly*,

Lieutenant General (retired) Leonard D. Holder, a former Commandant of the Command and General Staff College, describes tactics instruction at CGSC as "...tactics for Chaplains."⁹⁴ Holder's comment refers to the fact that officers of all branches receive a diluted form tactics instruction together. Because some of the officers in a class do not have a solid foundation in tactical principles, the course is taught with a focus on the lowest common denominator. What is missing is the academic rigor required to produce officers capable of producing creative, innovative and flexible plans. The 1996 Army War College study concluded that the most important attribute for a decision-maker of the future is strong metacognitive skills.⁹⁵ Unless academic rigor is returned to institutions such as CGSC, officers will not learn these skills through military education.

Curriculum at CGSC and the Captain's Career Course should be revised to include instruction on the various models for decision-making. This instruction could be reinforced through exercises that require different decision-making models, depending on the particular situation. As the Marines have learned, tactical decision games are an effective method for teaching intuitive decision-making skills. TDGs should be an integral, daily part of the curriculum at the Captains' Career Courses and tactics instruction at CGSC.

Training

As the Army adjusts its doctrine and educational institutions to embrace new concepts of decision-making, it should ensure that these new concepts are put into practice by the units in the field. This could be done by the CTCs taking the lead for the Army in experimenting with new techniques and methods. The OPFOR at the NTC has already contributed to this process by developing decision point tactics to overcome some

of the inadequacies of doctrine. If the CTC cadre encourages commanders and their staffs in units to apply emerging techniques for decision-making during training rotations, the appropriate techniques and methods will become evident

FM 101-5 describes decision-making as both a "science and an art." By endorsing the MDMP as the "only" method for decision-making, current Army doctrine and education dampens the minds of those attempting to master the art of war. The words, "There is still only one process..." should be stricken forever from FM 101-5 and all other Army doctrinal manuals.

In his book, *The Fifth Discipline*, Peter Senge describes how organizations can become "learning organizations...where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning how to learn together."⁹⁶ By revising doctrine, education and training to include other models of decision making the Army would be taking an important step toward becoming a learning organization.

ENDNOTES

¹ Gary Klein, "Strategies of Decision Making," *Military Review*, (May 1989) 61.

² Gary Klein, "A Decision-Centered Study of the Regimental Command Post," (Fairborn, OH: Klein Associates Inc.) 41.

³ LTC John F. Antal, "It's Not the Speed of the Computer that Counts! The Case for Rapid Battlefield Decision-making," *Armor*, (May-June 1998) 12.

⁴ Klein, "Strategies of Decision Making," *Military Review*, (May 1989) 56.

⁵ According to FM 101-5, each potential friendly COA should be evaluated against each possible enemy COA. Most staffs, however, pragmatically evaluate only a

single friendly COA against the most likely enemy COA because time does not permit a more thorough analysis.

⁶ United States Army, Center for Army Lessons Learned CTC Quarterly Bulletin 97-4, *Decision Point Tactics*, (Fort Leavenworth: Center for Army Lessons Learned, January 1997) I-1.

⁷ Klein, "A Decision-Centered Study of the Regimental Command Post," (Fairborn, OH: Klein Associates Inc.) 6.

⁸ Rex R. Michel, "Historical Development of the Estimate of the Situation," Research Report 1577, (Fort Leavenworth: US Army Research Institute for the Behavioral and Social Sciences, October 1990) 3.

⁹ James D. Hittle, *The Military Staff: Its History and Development*, (Westport, CT: Greenwood Press, 1975) 178.

¹⁰ Ibid.

¹¹ Ibid., 179.

¹² Ibid., 187.

¹³ Ibid., 194.

¹⁴ Michel, "Historical Development of the Estimate of the Situation," Research Report 1577, (Fort Leavenworth: US Army Research Institute for the Behavioral and Social Sciences, October 1990) 3.

¹⁵ Ibid.

¹⁶ Hittle, *The Military Staff: Its History and Development*, 199.

¹⁷ Ibid.

¹⁸ Ibid.

¹⁹ Arden Bucholz, *Moltke, Schlieffen and Prussian War Planning*, (Providence, RI: Berg Publishers, 1991) 158-176.

²⁰ Michel, "Historical Development of the Estimate of the Situation," Research Report 1577, (Fort Leavenworth: US Army Research Institute for the Behavioral and Social Sciences, October 1990) 3.

²¹ Ibid.

²² United States Army, Field Manual 101-5, *Staff Officer's Field Manual, Part 1*, (Washington, DC: US War Department, 1932).

²³ Michel, "Historical Development of the Estimate of the Situation," Research Report 1577, (Fort Leavenworth: US Army Research Institute for the Behavioral and Social Sciences, October 1990) 3.

²⁴ Ibid., 6.

²⁵ Ibid.

-
- ²⁶ Ibid., 7.
- ²⁷ United States Army, Field Manual 101-5, *Staff Organization and Operations*, (Washington, DC: Headquarters, Department of the Army, 1997) 5-27.
- ²⁸ Klein, "Strategies of Decision Making," *Military Review*, (May 1989), 56.
- ²⁹ John J. Fallesen, "Overview of Army Tactical Planning Performance Research," Technical Report 984, (Fort Leavenworth: US Army Research Institute for the Behavioral and Social Sciences, September 1993) 42-44.
- ³⁰ United States Army, Field Manual 101-5, *Staff Organization and Operations*, (Washington, DC: Headquarters, Department of the Army, 1997) 5-2.
- ³¹ Klein, "Strategies of Decision Making," *Military Review*, (May 1989), 56.
- ³² MAJ John A. Schmitt, "How We Decide," *The Marine Corps Gazette*, (October 1995) 16.
- ³³ Antal, "It's Not the Speed of the Computer that Counts! The Case for Rapid Battlefield Decision-making," *Armor*, (May-June 1998) 12.
- ³⁴ Fallesen, "Overview of Army Tactical Planning Performance Research," Technical Report 984, (Fort Leavenworth: US Army Research Institute for the Behavioral and Social Sciences, September 1993) 44.
- ³⁵ Justin Wintle, *Dictionary of War Quotations*, (New York: The Free Press, 1989) 85.
- ³⁶ Antal, "It's Not the Speed of the Computer that Counts! The Case for Rapid Battlefield Decision-making," *Armor*, (May-June 1998) 13.
- ³⁷ MAJ Kevin S. Donohue, *The Dynamic Synchronization Matrix: An Automated Decision Support Tool for the Campaign Planning Staff*, SAMS Monograph, (Fort Leavenworth: US Army Command and General Staff College, 1994) 28.
- ³⁸ Antal, "It's Not the Speed of the Computer that Counts! The Case for Rapid Battlefield Decision-making," *Armor*, (May-June 1998) 13.
- ³⁹ Ibid., 13.
- ⁴⁰ *The Army Digitization Master Plan Executive Summary (Coordinating Draft)*, (Fort Monroe, VA: US Army Training and Doctrine Command, November 1995).
- ⁴¹ Ibid.
- ⁴² Schambach, "Report on the Strategic Leadership Workshop: Strategic Decisionmaking in the Information Age." *US Army War College Web Site* (<http://carlisle-www.army.mil/usawc/dclm/wrkshp/rptprocd.htm>, 2 October 1996) 6.
- ⁴³ Ibid.
- ⁴⁴ Mary Eisenhart, "Surfing the Third Wave: Alvin and Heidi Toffler on Life and Work in the Information Age," *MicroTimes Web Site* (<http://www.microtimes.com/tofflers94.html>, 3 January 1994) 1.

⁴⁵ MAJ John W. Charlton, *Digitized Chaos: Is Our Military Decision Making Process Ready for the Information Age?*, SAMS Monograph, (Fort Leavenworth: US Army Command and General Staff College, 1997) 30.

⁴⁶ James G. March, *A Primer on Decision Making*, (New York: The Free Press, 1994) 2.

⁴⁷ Ibid.

⁴⁸ United States Army, Field Manual 101-5, *Staff Organization and Operations*, (Washington, DC: Headquarters, Department of the Army, 1997) 5-1.

⁴⁹ March, *A Primer on Decision Making*, 9.

⁵⁰ Ibid.

⁵¹ Fallesen, "Overview of Army Tactical Planning Performance Research," Technical Report 984, (Fort Leavenworth: US Army Research Institute for the Behavioral and Social Sciences, September 1993) 12.

⁵² Ibid., A-3.

⁵³ Ibid., 13.

⁵⁴ J.A. Olmstead, H.E. Christensen, and L.L. Lackey, "Components of Organizational Competence: Test of a Conceptual Framework," HumRRO Technical Report 73-19, (Alexandria, VA: HumRRO, 1973) 66-67.

⁵⁵ Fallesen, "Overview of Army Tactical Planning Performance Research," Technical Report 984, (Fort Leavenworth: US Army Research Institute for the Behavioral and Social Sciences, September 1993) 12.

⁵⁶ Ibid., 10.

⁵⁷ Ibid.

⁵⁸ Ibid.

⁵⁹ Shambach, "Report on the Strategic Leadership Workshop: Strategic Decisionmaking in the Information Age," *US Army War College Web Site* (<http://carlisle-www.army.mil/usawc/dclm/wrkshp/rptprocd.htm>, 2 October 1996) 6.

⁶⁰ Schmitt, "How We Decide," *The Marine Corps Gazette*, (October 1995) 17.

⁶¹ Ibid.

⁶² Shambach, "Report on the Strategic Leadership Workshop: Strategic Decisionmaking in the Information Age." *US Army War College Web Site* (<http://carlisle-www.army.mil/usawc/dclm/wrkshp/rptprocd.htm>, 2 October 1996) 6.

⁶³ Ibid.

⁶⁴ March, *A Primer on Decision Making*, 9.

⁶⁵ Ibid., 18.

-
- ⁶⁶ Ibid., 13.
- ⁶⁷ Ibid.
- ⁶⁸ Klein, "Strategies of Decision Making," *Military Review*, (May 1989) 58.
- ⁶⁹ Ibid.
- ⁷⁰ Schmitt, "How We Decide," *The Marine Corps Gazette*, (October 1995) 18.
- ⁷¹ Ibid.
- ⁷² Klein, "Strategies of Decision Making," *Military Review*, (May 1989) 58.
- ⁷³ Schmitt, "How We Decide," *The Marine Corps Gazette*, (October 1995) 18.
- ⁷⁴ Klein, "Strategies of Decision Making," *Military Review*, (May 1989) 58.
- ⁷⁵ Schmitt, "How We Decide," *The Marine Corps Gazette*, (October 1995) 20.
- ⁷⁶ March, *A Primer on Decision Making*, 58.
- ⁷⁷ Ibid.
- ⁷⁸ M. Mitchell Waldrop, *Complexity*, (New York: Touchstone, 1992) 11.
- ⁷⁹ Ibid., 12.
- ⁸⁰ Ibid.
- ⁸¹ Ibid., 279.
- ⁸² Ibid.
- ⁸³ United States Army, Center for Army Lessons Learned CTC Quarterly Bulletin 97-4, *Decision Point Tactics*, (Fort Leavenworth: Center for Army Lessons Learned, January 1997) I-1.
- ⁸⁴ Ibid.
- ⁸⁵ Ibid.
- ⁸⁶ Ibid.
- ⁸⁷ David G. Chandler, *The Campaigns of Napoleon*, (New York: McMillan Publishing Company, 1966) 396.
- ⁸⁸ Hittle, *The Military Staff: Its History and Development*, 199.
- ⁸⁹ Gary Klein, Klein Associates Inc., e-mail message to MAJ Robert Polk, 24 September 1999.
- ⁹⁰ Ibid.
- ⁹¹ Klein, "Strategies of Decision Making," *Military Review*, 56.
- ⁹² Shambach, "Report on the Strategic Leadership Workshop: Strategic Decisionmaking in the Information Age." *US Army War College Web Site* (<http://carlisle-www.army.mil/usawc/dclm/wrkshp/rptprocd.htm>, 2 October 1996) 6.

⁹³ Ibid.

⁹⁴ LTG (ret.) Leonard D. Holder, Jr. and Williamson Murray, "Prospects for Military Education," *Joint Forces Quarterly*, (Spring 1998) 84.

⁹⁵ Shambach, "Report on the Strategic Leadership Workshop: Strategic Decisionmaking in the Information Age." *US Army War College Web Site* (<http://carlisle-www.army.mil/usawc/dclm/wrkshp/rptprocd.htm>, 2 October 1996) 6.

⁹⁶ Peter M. Senge, *The Fifth Discipline: The Art and Practice of the Learning Organization*, (New York: Doubleday, 1990) 3.

BIBLIOGRAPHY

BOOKS

- Atkinson, Rick. *Crusade*. New York: Houghton Mifflin Company, 1993.
- Bucholz, Arden. *Moltke. Schlieffen and Prussian War Planning*. Providence: Berg Publishers, 1991.
- Byrd, Jack Jr. and L. Ted Moore. *Decision Models for Management*. New York: McGraw Hill Book Company, 1982.
- Caston, Art and Don Tapscott. *Paradigm Shift*. New York: McGraw Hill, Inc., 199.
- Chandler, David G. *The Campaigns of Napoleon*. New York: McMillan Publishing Company, Inc., 1966.
- Doerner, Dietrich. *The Logic of Failure*. New York: Metropolitan Books, 1996.
- Dupuy, Trevor N. *A Genius for War: The German Army and General Staff, 1807-1945*. Mclean, VA: The Dupuy Institute, 1984.
- Forester, C. S. *The General*. Baltimore: The Nautical and Aviation Publishing Company of America, 1982.
- Goerlitz, Walter. *History of the German General Staff*. New York: Frederick A. Praeger, Inc., Publishers, 1967.
- Hittle, James D. *The Military Staff: Its History and Development*. Westport, CT: Greenwood Press, Publishers, 1975.
- Heichal, Gabriella. *Decision Making During Crisis: The Korean War and the YomKippur War*. Ann Arbor: The University Microfilms International, 1984.
- Kelly, Kevin. *Out of Control*. Reading, MA: Addison-Wessley Publishing Company, 1994.
- Klein, Gary. *Sources of Power*. Cambridge: The MIT Press, 1998.
- March, James G. *A Primer on Decision Making*. New York: The Free Press, 1994.
- Mintzberg, Henry. *The Rise and Fall of Strategic Planning: Reconceiving Roles for Planning Plans, Planners*. New York, The Free Press, 1994.
- Moody, Paul E. *Decision Making: Proven Methods for Better Decisions*. New York: McGraw Hill Book Company, 1983.
- Nenninger, Timothy K. *The Fort Leavenworth Schools: Post Graduate Military Education and Professionalization in the US Army, 1880-1920*. Fort Leavenworth Kansas.
- Saaty, Thomas L. *Decision Making for Leaders*. Beaumont, CA: Lifetime Learning Publications, 1982.
- Senge, Peter M. *The Fifth Discipline: The Art and Practice of the Learning Organization*. New York: Doubleday, 1990.

Waldrop, M. Mitchell. *Complexity*. New York: Touchstone, 1992.

PERIODICALS

- Antal, John F., LTC. "It's Not the Speed of the Computer that Counts! The Case for Rapid Battlefield Decision-making." *Armor*. May-June 1998, 12-16.
- Holder, LTG Leonard D. Jr., and Williamson Murray. "Prospects for Military Education." *Joint Forces Quarterly*. Spring 1998, 81-90.
- Klein, Gary. "Strategies of Decision Making." *Military Review*. May 1989, 56-64.
- Klein, Gary and Major John F. Schmitt. "How We Plan." *The Marine Corps Gazette*. October 1999, 18-26.
- Palmer, Peter J., LTC. "Decision Point Tactics and the Meeting Battle: Fighting the Enemy, Not the Plan." *Infantry*. January-February 1997.
- Schmitt, John F., Major. "How We Decide." *The Marine Corps Gazette*. October 1995, 16-20.

US ARMY PUBLICATIONS

- Center for Army Lessons Learned CTC Quarterly Bulletin 97-4. *Decision Point Tactics*. Fort Leavenworth: Center for Army Lessons Learned, January 1997.
- Field Manual 101-5: *Staff Officer's Field Manual, Part 1*. Washington DC: US War Department, 1932.
- Field Manual 101-5: *Staff Officer's Field Manual, Staff Organization and Procedures*. Washington DC: Headquarters, Department of the Army, 1950.
- Field Manual 101-5: *Staff Organization and Operations*. Washington DC: Headquarters, Department of the Army, 1982.
- Field Manual 101-5: *Staff Organization and Operations*. Washington DC: Headquarters, Department of the Army, 1997.
- Student Text 100-9: *The Tactical Decisionmaking Process*. Fort Leavenworth: US Army Command and General Staff College, 1993.
- The Army Digitization Master Plan Executive Summary (Coordinating Draft)*. (Fort Monroe, VA: US Army Training and Doctrine Command, November 1995).

THESES, MONOGRAPHS, REPORTS

- Charlton, John W., MAJ. *Digitized Chaos: Is Our Military Decision Making Process Ready for the Information Age?* SAMS Monograph, US Army Command and General Staff College, 1997.

- Donohue, Kevin S., MAJ. *The Dynamic Synchronization Matrix: An Automated Decision Support Tool For The Campaign Planning Staff*. SAMS Monograph, US Army Command and General Staff College, 1994.
- Fallesen, Jon J. *Overview of Army Tactical Planning Performance Research*. Technical Report 984. Fort Leavenworth: US Army Research Institute for the Behavioral and Social Sciences, September 1993.
- Frame, John E., MAJ. *Gazing Into the Crystal Ball Together: Wargaming and Visualization for the Commander and Staff*. SAMS Monograph, US Army Command and General Staff College, 1996.
- Joyce, Thomas A., MAJ. *The Military Decision-Making Process and Special Forces Mission Planning: "A Square Peg for a Round Hole?"* SAMS Monograph, US Army Command and General Staff College, 1998.
- Kievennar, Henry A., MAJ. *Accelerated Decision Making at the Task Force Level*, MMAS Thesis, US Army Command and General Staff College, 1997.
- Klein Gary. *A Decision-Centered Study of the Regimental Command Post*. Final Contract Summary Report. Fairborn, OH: Klein Associates Inc., 12 August 1996.
- Matheny, Michael R., MAJ. *The Development of the Theory and Doctrine of Operational Art in the American Army, 1920-1940*. SAMS Monograph, US Army Command and General Staff College, 1988.
- Michel, Rex R. *Historical Development of the Estimate of the Situation*. Research Report 1577. Fort Leavenworth: US Army Research Institute for the Behavioral and Social Sciences, October, 1990.
- Olmstead, J.A., H.E. Christensen, and L.L. Lackey. *Components of Organizational Competence: Test of a Conceptual Framework*. HumRRO Technical Report 73-19. Alexandria, VA: HumRRO, 1973.

INTERNET SOURCES

- Eisenhart, Mary. "Surfing the Third Wave: Alvin and Heidi Toffler on Life and Work in the Information Age." *MicroTimes Web Site*, <http://www.microtimes.com/tofflers94.html>, 3 January 1994.
- Fallesen, John. "Lessons Learned on Tactical Planning: Implications for Procedures and Training." *Army Research Institute Web Site*, <http://www.ari.army.mil/lesslear.htm>, Spring 1995.
- Fallesen, John. "New Directions for Tactical Decision Making: Practical Thinking Instruction." *Army Research Institute Web Site*, <http://www.ari.army.mil/newdir.htm>, Winter 1995.
- Shambach, Stephen A. "Report on the Strategic Leadership Workshop: Strategic Decisionmaking in the Information Age." *US Army War College Web Site*, <http://carlisle-www.army.mil/usawc/dclm/wrkshp/rptprocd.htm>, 2 October 1996.

INTERVIEWS

Klein, Gary (Klein Associates Inc), interview by MAJ Robert Polk, 24 September 1999.