A SINGLE FLEXIBLE, RIGOROUS DECISION MAKING PROCESS

A Monograph
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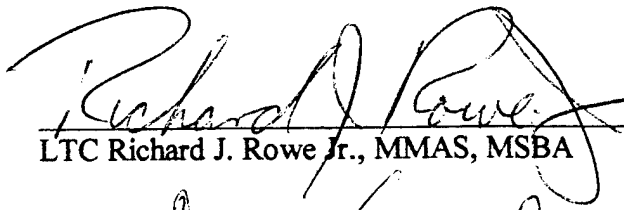

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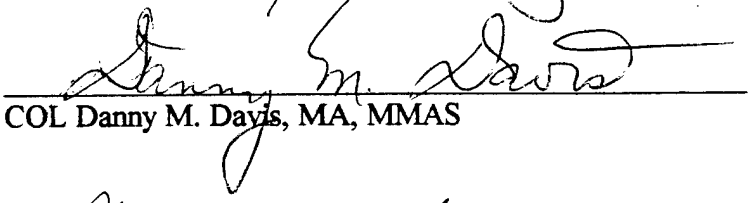

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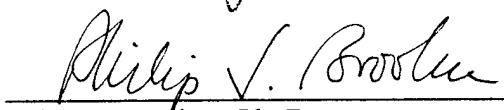

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ABSTRACT

A Single Flexible, Rigorous Decision Making Process by MAJ Thomas H. Cowan Jr., USA, 53 pages.

This monograph answers the question "Is there really more than one decision making process?" The history of the decision making process began with the Prussian Army. After they were defeated by Napoleon, they decided that they needed to educate their officers in how to make sound military decisions. This led to the great success that they experienced in the mid-1800's. The United States Army adopted their process in the 20th Century. As war became more complex, more steps were added to the process and the process became more and more complicated. In 1993 the Army added two new processes. The Army did this because the officers in the field complained that the Deliberate Decision Making Process (DDMP) was too rigid and too time consuming to use.

Upon careful examination of the three decision making processes using the problem solving methodology, this report determines that there really is only one process. The others are simply permutations of the first. Even though the DDMP is a very rigorous decision making process, it is important that commanders understand the spectrum of decision making that is inherent in the DDMP. With this knowledge they will know how to shorten the process.

As the United States Army prepares for combat in the 21st century, it is vital that commanders and staff fully understand the inherent flexibility in the DDMP. If they do not, then units of the future will find themselves dogmatically trapped in a process that was intended to be flexible from the very beginning of its history.

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Section I: Introduction

"The first demand in war is decisive action." - German Army Field Service Regulations[1]

Purpose and Methodology

The purpose of this monograph is to answer the question, "Is there really more than one tactical decision making process?" This paper will use the following methodology to answer this question. The history of the decision making process explains how the current doctrine evolved into the three different decision making processes in doctrine. This will provide the understanding necessary to follow the later analysis of the three decision making processes. An analysis of the three processes using the Problem Solving Methodology will determine three concepts: 1) the differences in the three processes, 2) the spectrum of decision making open to the commander, and 3) how the commander can adapt the process to a varying measure of time. In the last section, the conclusion will answer the primary question and give some ideas to solve the current conflict.

Background

Throughout the history of warfare, a commander's ability to make the correct tactical decision has determined success or failure on the battlefield. There are only a few examples of great commanders (Alexander the Great, Frederick the Great and Napoleon, etc.) who stood on the battlefield and instinctively knew what to do. This ability to see through the 'fog of war' with an 'inner light' is what Clausewitz called *'coup d'oeil*[2]. However, even in the days when combat was relatively simple and a commander could stand on the battlefield and see all of the elements involved in the fight, there were few

commanders that had this inner decisiveness. Many commanders in history could not make a good decision or made the wrong one. They relied on personal experience, gut feelings and 'the gods' to get them through the ordeal. There was no formal structure for aiding the commander in making decisions.

With the dawning of the Industrial Age, the battlefield became more complex. The commander could no longer stand on a hill and see all of the elements that would participate in the battle. His ability to exercise *coup d'oeil* in selecting the best course of action given a battlefield situation decreased as the level of complexity increased. As Dr. James Schneider of the School of Advanced Military Studies observed:

> The technology of the Industrial Revolution was dominated by innovations in distributed technology: the steam engine, the railroad, the telegraph, the dynamo, nitro based explosives and the magazine rifle all changed the geometry of warfare from action "compressed into a single point" to action distributed in depth. Fundamentally, this transformed simple armies into armies of great complexity.[3]

The inventions of the Industrial Age caused armies to become more dispersed. This dispersion increased even more in the 20th Century as weapons became increasingly lethal.[4] Today, with the advent of long range bombers, intercontinental missiles and space technology, all the elements involved in the fight may not even be in the same theater at the beginning of the fight.

Every action that a commander takes will not only have an immediate effect, but a second and third order effect. A commander must now try to anticipate events and effects that they can not personally see. Given this growing level of complexity, it is almost impossible to believe that a commander can make a good tactical decision without help.

In order to aid the commander in arriving at a good tactical decision, the United States Army created the tactical decision making process known as the Deliberate Decision Making Process (DDMP). This is the primary method taught at all service schools. Field Manual 101-5, Command and Control for Commanders and Staff, is the primary doctrinal manual on the DDMP and it explains how the Army believes that commanders and staffs should arrive at a tactical decision.[5]

Many field commanders complained that the formalized DDMP was too rigid, required too much time to execute and that they did not know how to shorten the process. Since the majority of the decisions made at lower levels during combat are done on a time constrained basis, this presented a major problem for the Army.[6] The Army then added two other decision making processes: the Combat Decision Making Process (CDMP) and the Quick Decision Making Process (QDMP). The manual does not give detailed guidance on how to apply either of these methods. It does address how they differ from the DDMP, but its lack of detail when discussing CDMP and QDMP has caused many problems in the application of these methods.[7]

One of the primary observations made by the Combined Training Centers (CTCs), the Battle Command Training Program (BCTP), after action reviews from Desert Storm and from the Center for Army Lessons Learned (CALL) is that Army units do not perform tactical decision making well. This problem is worse when time is a limiting factor. Units do not know when or how to shorten the DDMP, nor do they know how to use the CDMP or the QDMP. These lessons learned are not new, nor are they lessons limited to certain units. This same observation has been made since the Army started collecting

lessons learned. Is this a training problem or should the Army doctrine be more explicit in order to aid the units in the field? Regardless of the reason, the Army must fix the problem prior to entering the 21st Century.

Significance

A new age of man is dawning and the United States Army must be prepared for it. Alvin Toffler in his 1980 book, the Third Wave, observed a growing phenomenon: the beginning of that new age. He states that this new era is going to fundamentally change the way man lives.[8] He sees this as the third major civilization of mankind. Small villages and an agrarian society characterized the first wave. The mighty expansion and power of the industrial age defined the second age and the defining characteristic of the third wave (or information age) is the computer and information flow. Toffler believes that just as there were major struggles between the people of the first era and the second during the colonial wars, violence will increase with the dawn of this new age:

> The super-struggle between these Second and Third Wave forces, therefore, cuts like a jagged line across class and party, across age and ethnic groups, sexual preferences and subcultures. It reorganizes and realigns our political life. And, instead of a harmonious, classless, conflict-free, non-ideological future society, it points toward escalating crises and deep social unrest in the near term future. Pitched political battles will be waged in many nations, not merely over who will benefit from what is left of industrial society but over who participates in shaping, and ultimately controlling its successor.[9]

Starting in 1977, the United States Army took notice of these trends and began preparing for this new information age. General Don Starry, the commander of the Training and Doctrine Command (TRADOC), began to restructure the way the army would fight its next wars. The Army introduced new systems and new concepts to take

advantage of this new era. The Army's ability to synchronize the elements of combat power using information and communication at the right place and time during Desert Storm clearly demonstrated a new era of combat.[10] This effort continues today in the Force XXI project.

As we continue into the 21st century, information will both be an adversary and a friend to the leaders of that new age. Future leaders' ability to handle intelligence properly will determine their success or failure. As retired Chief of Staff of the Army Gordon Sullivan said, "never before have armies been challenged to assimilate the combined weight of so much so rapidly. In this environment, the payoff will go to organizations which are versatile, flexible and strategically agile, and to leaders who are bold, creative, innovative and inventive. Conversely, there is enormous risk in hesitation, undue precision and a quest for certainty."[11]

Tactical commanders will have access to more information than they ever before. If commanders have not properly determined what intelligence is important, then they will be worse off than if they did not have the information at all.[12] TRADOC Pam 525-5: Force XXI Operations states that "information technology is expected to make a thousandfold advance over the next 20 years."[13] If this is true, then units can easily become inundated with information from many sources. They will have to process these large amounts of information and make decisions much more quickly than they do today. If our tactical units are having problems with the process today, then as more information becomes available to them the situation will only get more complicated.[14]

In order to handle the challenges of the 21st Century, the Army must have a decision making process that facilitates making rapid decisions. Information technology will provide the ability to make decisions much more quickly. It will speed up the tempo of combat and allow the Army to overwhelm its opponents.[15] By computerizing the decision making process in the corporate world, businesses have increased their executives' ability to manage information, their ability to make decisions and their span of control. The computer has allowed them to reduce staff levels, increase their flexibility and speed up their decision making cycles.[16] There is no reason to believe that the computer can not do the same thing for the United States Army. However, if commanders do not understand the decision making process, then computerizing the process will not help.

Since time is a critical factor, a commander must understand how to adjust the process to different amounts of time available. In the United States Army commanders make decisions. Processes do not. As James C. Madigan and George E. Dodge pointed out, "no matter how well automated, no matter what level of technological sophistication of the processes and procedures built into command and control hardware and software, systems do not make decisions; commanders do."[17] Therefore unless commanders properly understand the military decision making process and the flexibility inherent in the process, all of the advances of the information technology will fail them.

Section II: History of the Process

"Military history, accompanied by sound criticism, is indeed the true school of war." - Lieutenant General Antoine-Henri Baron de Jomini[18]

In order to gain an appreciation for the decision making process, it is necessary to review the history of the current Army doctrine. By looking at the roots of the process and its transformations through time, it will be easier to understand why the Army conducts the process the way it does.

The history of the DDMP has its roots in the Prussian military traditions of the 1800's. Under Frederick the Great, Prussia had developed a reputation on the continent as a formidable adversary. Starting in the mid-1700's, the Prussian model served as the best example of a military system in Europe for almost fifty years. Other countries in Europe copied the organization, discipline and methods of training from Frederick's army. However, all of this was to end at the battles of Auerstadt and Jena in 1806.[19]

Following the devastating defeat at the hands of Napoleon, the Prussian Army realized that it took a genius such as Frederick the Great to make their system work on the battlefield. The Prussian leadership knew that they would not always have such genius standing in the wings when someone attacked their country. From this experience the Prussians learned that "it is safer and wiser to develop by training a high average of ability in leadership than to trust to untrained 'common sense,' or to the possible advent of a genius."[20] They decided that it was necessary to educate and train their future military leaders for combat.

Following the defeat at Jena, General Gerhard von Scharnhorst, the President of the Military Reorganization Commission, set out to remodel the Prussian Army.[21]

Although he recommended and implemented many changes, there were two that would have a major long term impact. The first was the creation of a special division that was responsible for plans, mobilization, peacetime training and the education of the army. He called this division the general staff. The second change was the founding of the *Kriegsakademie* in Berlin in 1810.[22] Officers studied past campaigns at this staff college. This study gave them a base of knowledge and framework for rigorous analysis. The officers then used this knowledge to analyze possible future campaigns.[23] This college was to begin disseminating this method of analysis throughout the army. Some of the best military thinkers of the Prussian Army were brought to this academy as faculty. Carl von Clausewitz, who served as the commandant of that school from 1818 until just before his death in 1831, was later to capture a theory of war in his treatise, On War.

Clausewitz described war as a combination of both quantifiable and unquantifiable factors. Clausewitz did not believe in principles that could be applied to every situation. He differed dramatically on this aspect from Jomini, a military author writing in the same time frame. Jomini described certain principles which he believed dictated the decisions that a commander should make on the battlefield. Clausewitz did not deny many of the ideas that Jomini presented. He objected to their blind use to dictate decisions without the understanding that showed their limitations.[24] Even Napoleon, who admired Jomini's work, pointed out that he had captured the chief principles, but that he did not capture the intuition of how to use them.[25] War was a very complex matter full of chance and friction. Clausewitz believed that the only way that a commander could succeed was to understand:

> Circumstances vary so enormously in war, and are so indefinable, that a vast array of factors has to be appreciated - mostly in the light of probabilities alone...Bonaparte rightly said in this connection that many of

> the decisions faced by the commander-in-chief resemble mathematical problems worthy of the gifts of a Newton or an Euler.[26]

The important aspect was that the officer know how to think and analyze each situation. Every situation would be different and the selection of an appropriate course of action depended upon an analysis of the particular situation.

In 1857, a graduate of the *Kriegsakademie* and an avid student of Clausewitz, Helmuth von Moltke, became chief of the Prussian General Staff and transformed the staff into a very formidable organization. He personally selected and trained the best graduates of the *Kriegsakademie* to become members of the General Staff. These officers went through very rigorous training on how to think and analyze a situation. Moltke then had these officers assigned to varying positions between staff jobs and command jobs in the Prussian Army. They were not just theorists, they were also specialists trained in the skills necessary to aid the commander in making decisions. They were an intelligent group of officers who provided their commanders with a constant supply of information and analysis.[27] The end product was that by the mid 1860's Von Moltke had largely trained the army to his method of thinking. Many brigade and divisional commanders had trained under Von Moltke, as had every corps and army Chief of Staff. Von Moltke had taught each one of them how to think.[28]

What this created in the army was an ability to synchronize the actions of a large army on the battlefield with very little direct guidance. This general staff was to prove its worth in 1866 when Prussia attacked along multiple routes and defeated the Austrians at the battle of Koniggratz. Although this quick and decisive victory taught the Prussians the value of the general staff, most other countries did not really appreciate the significance of

the war. The reason was because the Austrians had lost many times before. It was not until 1870 and the stunning defeat of France, the recognized military power of Europe, in the Franco-Prussian War that the rest of the world took notice of the General Staff. Other countries then began trying to incorporate it into their own systems. The other countries noticed the value of having a core of officers trained in a common doctrine that would come up with approximately the same answer when faced with a tactical situation.[29]

At the turn of the 20th Century, the United States Army's Infantry and Cavalry School at Ft. Leavenworth, Kansas first started teaching the Prussian method for analyzing the situation. During that first decade, the school evolved and refined this process. This process was the systematic means that the instructors required the students to use in order to explain and justify their solutions to classroom tactical problems. One student later observed, "nobody prior to this time had directed attention specifically to the factors which ought routinely to be taken into account in the decision-making process."[30] From this process came the Estimate of the Situation procedure. Captain Roger S. Fitch first published this process in a book that the students used to study tactical problems. The book explained the approach and then gave a very large number of practical applications.[31]

The Estimate of the Situation became army official doctrine when the army included passages of Captain Fitch's book in the Army Field Service Regulations of 1910.

> An estimate of the situation involves a careful consideration from the commander's viewpoint, of all the circumstances affecting the particular problem. In making this estimate he considers his mission as set forth in the orders or instructions under which he is acting, or as deduced by him from his knowledge of the situation, all available information of the enemy strength (strength, position, movements, probable intents, etc.), conditions affecting his own command (strength, position, supporting troops, etc.) and

> the terrain insofar as it affects the particular military situation. He then compares the various plans of action open to him and decides upon the one that will best enable him to accomplish his mission.[32]

Even in this simple beginning the essential elements of the current process were evident. Those essential elements were: mission analysis, course of action development, course of action analysis, and decision. These elements would remain the center of the process.

The army included the Estimate of the Situation process in the first Field Manual 101-5: Staff Organization and Operations in 1932. The army designed this new manual to lay out the doctrine for staff organizations and explain how those staffs were to operate. The new FM stated that the Estimate of the Situation was largely a mental exercise and its steps were to be a "train of thought sequence."[33]

This manual laid out the doctrine for command and control procedures within the army. The steps of the process in 1932 were:

1. Mission
2. Opposing Forces
    a. Enemy forces
    b. Own forces
    c. Relative combat strength
3. Enemy Situation
    a. Plans open to enemy
    b. Analysis of enemy's plans
    c. Enemy's probable intentions
4. Own situation
    a. Plans open to you
    b. Analysis of plans
5. Decision [34]

The United States Army was not the only service stressing the need to have an organized method for arriving at a sound decision. The United States Naval War College had been publishing a text book entitled the Sound Military Decision including the Estimate of the Situation and the Formulation of Directives since 1909. In their 1936 version, however, they pointed out a problem that they believed commanders were beginning to have in applying the process:

> It is important that the estimator employ this form in estimating situations, while bearing in mind that form is never more than a means to an end, and that sound decision is the true goal. The standard form, is therefore, to be viewed as a flexible guide...A thorough grasp of the technique of employing the form, including a correct appreciation of its flexibility, will be a valuable reinforcement to judgment and experience in reaching sound decision.[35]

Some commanders were becoming so involved with the process that they forgot that the important thing was the end result, a sound decision.

Combat had reached new levels of complexity by the 1940's. War was raging in Europe already. The ranges of weapon systems had increased dramatically. The airplane had become a major factor in warfare and machines now moved forces around on the battlefield with speed that was never before possible. With all of this added complexity, the 1940's version of FM 101-5 required the commander to develop multiple "lines of action" and to compare each to the possible enemy "lines of action".[36] Today the Army calls those "lines of action" courses of action. This is where the Army gets the need to compare friendly possible courses of action to the enemy courses of action. The manual does, however, go on to say that there are two points to remember when developing multiple options. First of all, if only one course of action seemed open, the commander

could go straight to the decision. The second point was that "as a general rule no more than two or three own lines of action need to be carried further for further analysis".[37] It was this analysis step that was going to see the most change in revisions of FM 101-5. The manual for the first time stated that the estimate was a continuous process for the commander and that the "estimate should be as thorough as time allowed."[38] At the time the estimate was a written form that the commander could fill out. The manual also recognized that at division and below the commander would do the process mentally without written products and that the commander could use the form as a mental checklist.

The analysis of the situation had always been a logical process that included as much quantifiable data as would aid the commander, but the United States Army wanted to increase the science of conducting war. They wanted to leave less to chance and personal feelings. The army was expanding too fast to believe that all the commanders would have the experience necessary to make a good tactical decision without help. Around the beginning of the 20th century, about the same time that the army was developing the commander's estimate, Frederick W. Taylor began to lay the foundation for quantitative approaches to decision making. This was to become the scientific management revolution of the early 1900's. This work created the field of operations research, "the systematic application of quantitative methods, techniques, and tools to the analysis of problems involving the operation of systems."[39] During World War II, the army formed operations research teams to use the scientific method in solving many of the strategic, operational and tactical problems facing the military. These teams often

consisted of people from very different backgrounds. There were mathematicians, engineers and behavioral scientist. By combining their talents, they were able to solve many of the problems facing the military. The revisions to FM 101-5 after the war begin to show the influence of these operations research techniques.[40]

In the 1950 version of FM 101-5, the estimate process expanded to include the staff. With this edition, the operations research techniques became more pronounced in the process as the staff began to provide estimates to the commander. There were examples of intelligence, logistical and personnel estimates. The 1950 version also included an administrative commander's estimate that the unit used in determining support requirements for an operation. This estimate was primarily a logistical matter and its "data and reasoning [were to be] contained in a preliminary logistical estimate."[41] This estimate included many factors that were quantifiable and would aid the commander in making his tactical estimate. In the example, the commander used an "if this, then that" format for conducting the analysis of each course of action when compared to enemy capability. From this analysis he then derived his advantages and disadvantages.[42] This was the beginning of a simulation process that the commander used to analyze courses of action.

Following the Korean War, the Army updated the process by adding a civil-affairs estimate. This 1954 manual also noted a potential problem with time and stated that the process "may vary from a short, almost instantaneous, mental estimate to a carefully written document requiring hours of preparation and the collaboration of various staff officers."[43] If time allowed and the staff had completed their estimates, then the commander was to include portions of the staff estimates in his commander's estimate.

However, the manual did go on to say that when action was urgent the commander should make a rapid mental estimate and make a decision.

In 1960, the staff became the primary agent for developing the overall estimate "for the commander".[44] This was to begin a rapid increase in the number of written products which the staff generated in order to aid the commander in making a decision. The focus for the staff became a detailed investigation to find the "best" course of action. However, this version also states that the commander in his planning guidance gives the staff "any actions which he wishes to be developed."[45] The commander should give his planning guidance before any estimates have started. This version laid out the criteria for determining a good course of action for the very first time: feasibility, accomplishability, and distinguishability. The 1960's version also saw the introduction of the term the "military decision making process". This process placed the commander's estimate within the broader concept known as the decision making process.[46] This version also continued the 'if, then' method for analyzing each course of action.

The 1968 version of FM 101-5 lays out battlefield problems in what it called the problem solving methodology. This methodology consisted of: 1) recognizing the problem, 2) gathering the data needed, 3) developing and listing possible courses of action, 4) analyzing possible solutions, 5) selecting the best solution.[47] This was the formal recognition by the Army of the use of the Problem Solving Method (PSM) in making decisions. The PSM was and is the very core of the decision making process. According to the Army Research Institute, "the new science of decision making was emerging as a serious field of study and a generally accepted best way of solving

problems."[48] Even though the process was becoming more scientific, the manual still stated that the method that the estimator used to arrive at a decision was a matter of personal determination. It did qualify this remark by stating that "sound decisions result only from a thorough, clear, unemotional analysis of all data pertinent to the situation."[49] Also included in the 1968 version was the term wargaming. Wargaming was the name applied to the 'if, then' methodology used in the previous versions. This process was a visualization by the commander of the combat actions and effects that would occur on the battlefield from current dispositions to the objective.[50] The Army included a section entitled "Sequence of Actions in Making and Executing Decisions." This section went through a step by step description of how a commander and his staff were to execute the process. Figure 2-1 captures this procedure.

Although this procedure gave a defined sequence for making decisions, the doctrine still did not consider the procedure prescriptive. This 1968 version and the 1972 version reiterated the comment that the method that the estimator used was a matter of personal determination. It also stated that the process at division and below was normally only a mental process with the format being used as a guide.[51]

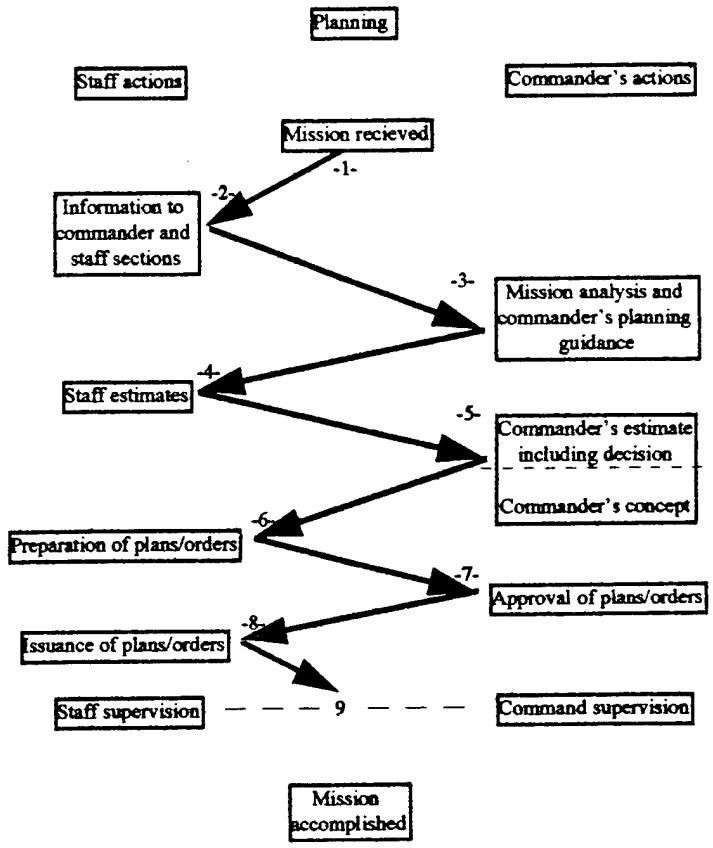

Figure 2-1: Sequence of Actions in Making and Executing Decisions (1968)[52]

The 1984 version of FM 101-5 under the title "Military Decision Making Process" used almost the same process sketch as the 1968 version. The only difference was that there was an "information to staff" box added on the right side under the commander's action side. An arrow pointing both ways connected the staff to commander and the commander to staff information boxes. These arrows demonstrated the need for the staff and the commander to share information. The 1984 manual gave a very important assessment of the impact of time on the process. It said that often time becomes the most critical factor in the decision making process. When this happens the commander may have to make the decision "without taking the time required to formally include the staff in the process."[53] The manual did not say that the commander will not use the process, but

that he may not have time to include the staff in the process. Up to this point the comparison of courses of action was a simple comparison of the advantages and disadvantages of each course of action. The process based this comparison on the results of the wargame. The commander could list what he determined to be significant factors and compare each course of action based upon those significant factors. The manual stated that a good method of looking at the comparison of these significant factors is in a decision table. A decision table is simply a chart with the courses of action on the left and the factors across the top. The analysis of that course of action based on that factor written in words in the block.[54]

During the 1980's and into the 1990's the Army created a very extensive, externally evaluated training program that included the training centers, and the battle command training program (BCTP). During this time, the army also established the Center for Army Lessons Learned (CALL) to capture the observations from this training which could benefit the rest of the army. CALL repeatedly pointed out that units were having problems working the decision making process in time-constrained situations.[55] The Army Research Institute (ARI) did a series of studies on the process between 1990 and 1992.[56] With the CALL letters and the ARI studies in mind, the Final Draft Version of FM 101-5 in 1993 included three different decision making processes. It is this version of FM 101-5 which this paper is going to analyze further.

This section has shown the evolution of the decision making process from its beginning in Prussia through its evolution to 1993. The purpose was to lay the foundation of understanding that will be necessary to analyze the current doctrine and see if it keeps

the purpose and intent of the process that allowed Prussia to overcome the devastating defeat of that cold day in 1806.

Section III: The Current Doctrine

"I believe that a general who receives good advice from a subordinate officer should profit by it...Ideas of others can be as valuable as his own and should be judged only by the results they are likely to produce." -Frederick the Great[57]

The purpose of this section is to present the current doctrine for tactical decision making. The authoritative source for the current doctrine is the 1993 final draft version of Army Field Manual 101-5 (Final Draft).[58] A thorough understanding of the three decision making processes currently in Army doctrine will be necessary for future analysis in the next section. This section depicts the processes as the 1993 version of FM 101-5 describes them.

Deliberate Decision Making Process (DDMP)

The Deliberate Decision Making Process (DDMP) is the formal process that takes the most time and involves the most input from the staff. Commanders and their staff normally use the DDMP before hostilities have started. It is a sequential planning process which is a methodical application of the estimate of the situation. It is usually a process that requires a large number of written products. One of the obvious characteristics of this planning process is the parallel nature by which the staff and the commander go through the same procedures. Figure 3-1 is the doctrinal depiction of the DDMP.

The process begins when either the commander determines there is a new mission or when the unit receives a new mission from a higher headquarters. If the commander perceives the new mission, then the commander will specify to the staff the new tasks so

that they may begin working on the DDMP. If the mission comes from a higher headquarters, then the higher headquarters will include relevant tasks in its plan or order. The staff begins the DDMP upon receipt of the new mission.

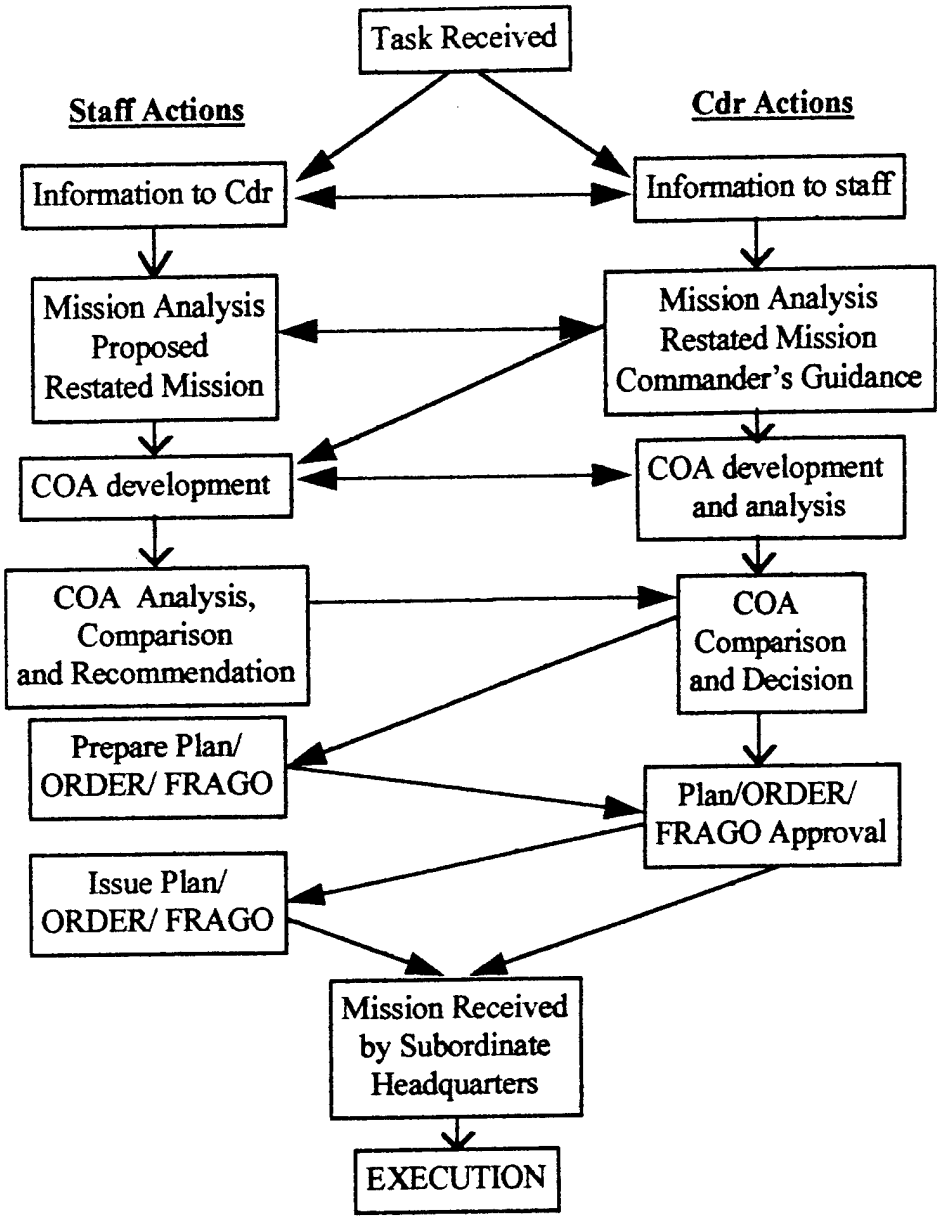

Figure 3- 1: DDMP as shown in 1993 version of FM 101-5[59]

During the information step, both the staff and the commander are gathering the facts and assumptions necessary to conduct the process. Facts are statements of known data that have a direct impact on the situation at hand. These should include consideration of all important knowledge about the enemy and friendly troops. Staff projections and assessments should also be included and shared with the commander during this stage. Whenever there are missing facts which are necessary for planning, the commander or the staff must make assumptions. The staff should carefully document the assumptions so that as the staff gathers more information the assumptions can be proven or disproven. If an assumption is disproven, then the staff or the commander must do a complete evaluation of the impact of this false assumption. Intelligence preparation of the battlefield is a vital part of this step. If time is short, the information steps may be mental exercises.

The next concurrent step in the process is mission analysis. According to FM 101-5, mission analysis is a process which has eleven sub-steps. The staff and the commander fully examine the mission that they will have during mission analysis. They consider the intent of the higher headquarters and concept of the operations. They completely review their current situation. They look at their specified and implied tasks tasks.[60] The staff then uses the essential tasks to identify a restated mission statement and they get the commander's approval on the restated mission.

After mission analysis is complete, the commander will give the staff his commander's planning guidance and the staff will issue a warning order to its subordinate units giving them the approved restated mission. In the commander's planning guidance,

the commander should provide the staff focus for the planning process. This guidance should contain information in the following nine areas:

1. Enemy Courses of action (COA).
2. The restated mission.
3. Intent.
4. The concept of operation.
5. The deception objective.
6. Priorities.
7. The time plan.
8. The type of order to issue.
9. The type of rehearsal to conduct.

The next step in the DDMP for the staff is COA development. Concurrently, the commander is doing COA development and analysis. During COA development, the staff develops for future analysis the number and types of COAs that the commander specified in his commander's guidance. These COAs should all be suitable, feasible, acceptable, distinguishable and complete.[61] After the staff has developed the required COAs, they should brief the commander on them before progressing on in the process. Although the doctrine does not specifically state this, it implies it by the arrow connecting the two blocks and by the presence of a COA brief format in the appendix of FM 101-5.

The heart of the DDMP lies in the three part COA analysis step. The first part is the wargaming stage. The wargame is an attempt by the wargamer to visualize the most likely outcome of the battle. The wargamer or wargamers conduct the wargaming drill on each COA separately. The wargame is a detailed action-reaction-counteraction analysis of the battle. This drill results in a modified COA that the staff has synchronized to ensure that all of the battlefield operating systems have optimized the expected results of the COA. The wargame also provides wargamers with insights into the battle flow: branches

and sequels, requirements for deception and surprise, anticipated losses for both friendly and enemy forces, and advantages and disadvantages for that COA.

The second part of COA analysis is operational analysis and risk assessment. Its purpose is to look at the critical events in the wargame and try to minimize the loss of both equipment and personnel. Operational analysis and risk assessment have five sub-steps. The first is identifying the risks and the major events. The second step is assessing the risks. In the third step, the person or people doing the assessment look at the critical events and make recommendations on the acceptability of the risk at that point. They then make a recommendation on controls that will lower the risk. In step four, they balance the benefits of the COA with its potential risks and in the fifth step the commander approves the controls for limiting the risk.

The third part of COA analysis is comparison. This is a direct comparison of each COA in order to determine the best one. The criteria used in the comparison of COAs comes from the commander or in the commander's absence from the commander's guidance. There are several different techniques for comparing COAs. One method is just a comparison of the listing of advantages and disadvantages. The other is the use of a decision matrix in comparing the COAs. Once the person conducting the COA comparison finishes, the COA analysis step is complete.

The unit does the rest of the DDMP in sequence. The staff makes a recommendation to the commander on which COA to choose based upon their COA analysis. The commander makes a decision based upon the staff's recommendation and his own COA analysis. The staff using the results of the wargame prepares the plan, or

order. The commander approves the plan or order and the staff issues the order. The subordinate headquarters receive the order and they execute the order. This is the DDMP.

Combat Decision Making Process (CDMP)

The CDMP is the process that commanders will use most often during combat operations when time is a problem. The primary characteristic of this method is that this is a commander-driven process. Even if a proficient staff is present, time does not allow the use of the full DDMP process. The CDMP is a derivative of the DDMP and uses many of the products that the staff produced when creating the original order. The CDMP normally only includes one enemy and one friendly COA. The CDMP is depicted in Figure 3-2.

The commander starts the CDMP by assessing a changing situation. When this happens he has three choices. He can proceed with the original plan. He can create a new concept or he can proceed with modifications from a branch of the original plan. If he decides to proceed with the original plan he does nothing.

If the commander elects to come up with a new concept or make modifications to a branch, he can either develop it himself or have the staff do it. If he wants the staff to do it, he should provide them with definitive guidance on a COA or the modifications to make to the branch. This is necessary because the purpose of the CDMP is to make decisions in time-constrained environments.

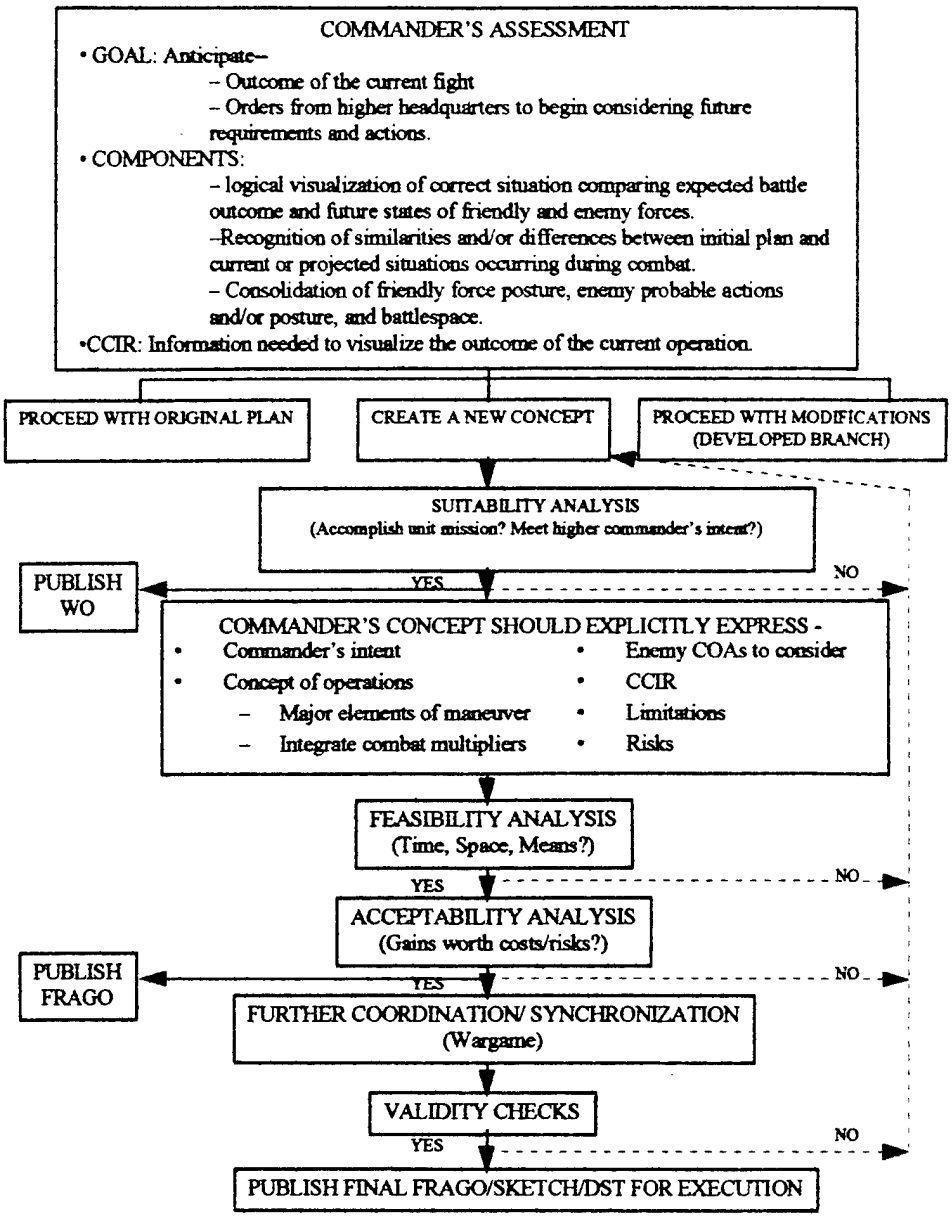

Figure 3- 2: CDMP[62]

After arriving at a new concept, the commander must conduct a suitability analysis. He does this to determine if the concept meets the next higher commander's intent. If it does and it will accomplish the mission, then the commander should issue a warning order. The commander should ensure that this concept includes:

- The commander's intent

- The concept of operation, including major elements of maneuver for critical combat functions (FS, deception, aviation, deep operations, and so on)
- Enemy COAs to be considered
- Commander's critical information requirements
- Limitations
- Risks

After the commander determines that the concept is suitable, he and the staff then conduct a feasibility analysis on the concept. Using quantitative analysis, the commander and staff determine if the unit has the time, space and means to execute the concept.[63] If the commander determines that a concept is infeasible, he should go back to the beginning and develop a new concept or make a modification to a branch plan. From this point they start the process over again.

If the concept is feasible then the commander must conduct an acceptability analysis. The commander does this analysis to determine if the gains from executing the new concept are worth the expenditures and risk. This is largely a subjective call that the commander makes based upon his experience and understanding of the situation. Once the commander determines that the concept is acceptable, the staff issues the fragmentary order (FRAGO). The staff then continues to wargame the concept in order to synchronize all of the available assets. If the commander determines that the concept is not acceptable, the process is re-initiated.

The last step in the CDMP is for the commander and staff to conduct validity checks to ensure that the situation has not changed. If changes are significant, the process starts over again based on the new situation. If not, then the staff issues the plan and the unit executes.

Quick Decision Making Process (QDMP)

The QDMP is the process that commanders use when either the staff is not present or when the staff is limited in either strength or capability. The process generally follows the troop leading procedures. The QDMP is depicted in Figure 3-3.

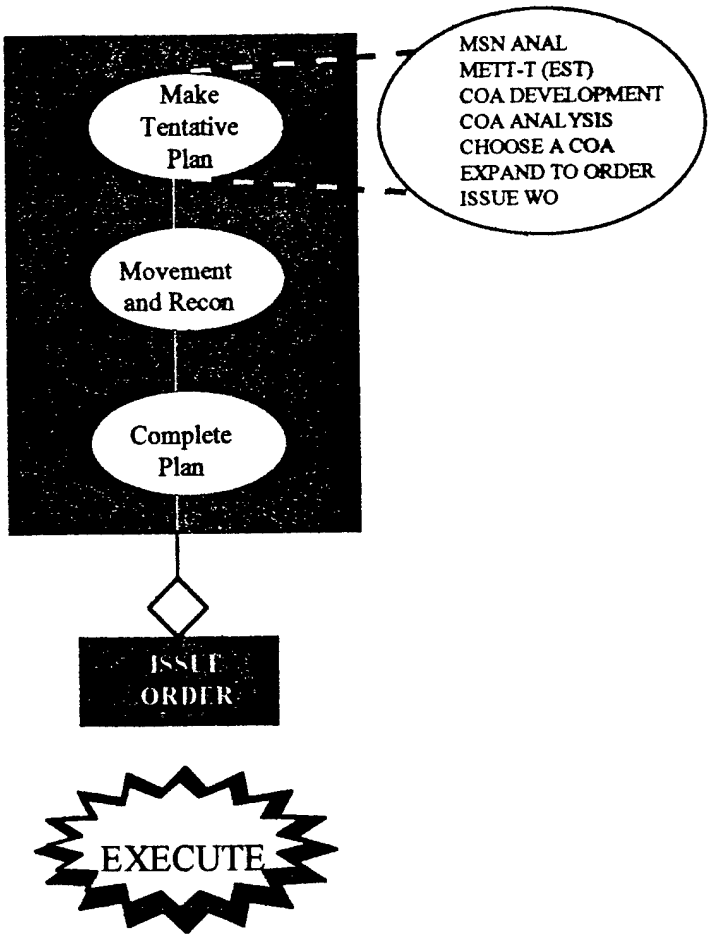

Figure 3- 3: QDMP[64]

During the QDMP the commander does almost all of the work himself. The staff, if available, provides information as time and the situation permit. Their primary purpose is to coordinate the details during execution of the commander's decision.

The process begins with the receipt of a mission or the deduction of a new mission by the commander. The commander conducts a mission, enemy, terrain, troops and time (METT-T) analysis. Then he issues a warning order to his subordinate units.

Once he has issued a warning order, the commander begins making a tentative plan. He does this by conducting a commander's estimate. If he had a staff, he could issue his planning guidance or if time is a problem, he may just issue initial controlling instructions.

The commander considers different COAs. He can have the staff help him or he can do this himself. If the commander does not have a lot of time, he may do this step mentally using his experience to compare possible COAs.

The commander analyzes each COA by wargaming them. After wargaming each, perhaps mentally, he compares them and makes a decision. Once he has chosen a COA, he must start his subordinates' movement to the area of operations. While the subordinate units are moving, the commander conducts a reconnaissance to confirm his tentative plan.

After his reconnaissance, the commander completes the plan by conducting a wargame. He should ensure that he includes any changes based upon his reconnaissance in the wargame. The end product is a plan that has a complete task organization and the proper controls necessary to execute. The commander then issues the order.

Section IV: Analysis of the Processes

"A good solution applied with vigor now is better than a perfect solution ten minutes later." -General George S. Patton, Jr.[65]

The purpose of this section is to analyze the three decision making processes using the Problem Solving Methodology. This analysis will determine if there really is a

substantial difference in the three processes. It will demonstrate the spectrum of decision making open to the commander. Finally, the analysis will help show how the commander can adapt the DDMP to a varying measure of time.

Problem Solving Methodology (PSM)

Although doctrine calls them decision making processes, in reality all three are problem solving processes.[66] Joint Publication 1 reiterates this point when it says "war is taking any problem exactly as you take a problem of your own life, stripping it down to its essentials, determining for yourself what is important and what you can emphasize to the advantage of your side; what you can emphasize that will be to the disadvantage of the other; making a plan accordingly."[67] The doctrine actually recognized this in 1960 and included a description of the problem solving methodology in subsequent FM 101-5. By examining the three decision making processes using the Problem Solving Methodology (Figure 4-1), this report will be able to detect any significant differences among the three processes.

In the first and second steps of the PSM, the executor is trying to define the problem and determine the assumptions and/or limitations that affect the solution. These steps are present in all three. The DDMP calls this mission analysis, a procedure executed by both the commander and staff. The CDMP calls these steps the commander's assessment because it is done largely by the commander with minimal input from the staff. In the QDMP, the commander makes a tentative plan by first conducting a mission analysis using METT-T. Therefore, each of the three processes include the first two steps with the only difference being labels and much input the staff has.

Problem Solving Methodology

1. Define the problem.
2. Determine the assumptions and/ or limitations which affect the solution.
3. Identify the possible courses of action.
4. Isolate the decision-making criterion (or criteria).
5. Determine and compare the possible outcomes and the probability of success in reaching the objective for the various courses of action.
6. Make the decision (select a course of action).
7. Implement the decision.
8. Monitor the results of the decision.

Figure 4- 1[68]

The executor identifies the possible courses of action in step three of the PSM. In the DDMP, the commander uses his planning guidance to determine who does COA development and which COAs are developed. In the CDMP, the commander uses his experience and mentally explores different possible COAs before he gives the staff his new concept or gives them the guidance necessary to come up with a new concept. In the QDMP, the commander making a tentative plan is COA development. Therefore the difference in the three processes is who does the step and whether it is completely mental or requires written products.

In steps four and five of the PSM, the executor isolates the decision-making criterion (or criteria), determines the possible outcomes and the probability of success in reaching the objective for the various courses of action. In the DDMP, the staff and the commander accomplish these steps under COA analysis based upon the commander's

planning guidance. In the CDMP, the commander does this in his head before he gives the staff the new concept or the detailed guidance for the new concept. In the QDMP, the commander does COA analysis as part of making a tentative plan. During this portion of the PSM, the only major differences are who does the steps and whether they are mental or written. The rest of the steps of the PSM [make the decision (select a course of action), implement the decision and monitor the results of the decision] are exactly the same in each process.

By comparing the three processes using the PSM, it looks like the processes are structurally the same. The only differences in the processes are who does which steps, and is the step completely mental or are written products required to aid the decision maker.

As part of their Newsletter to aid the field in applying the new processes, CALL diagrammed the different planning processes. These diagrams are shown in Figure 4-2. A careful examination of the three processes shows that the only true difference between the processes is the extent to which the commander uses the staff in helping him make a decision. The primary steps (mission analysis, COA development, COA analysis and decision) are the same in each process. In the DDMP the commander determines how much his staff helps and gives them this information in his guidance. Therefore it seems that there is only a single process and the others are simply permutations of that process.

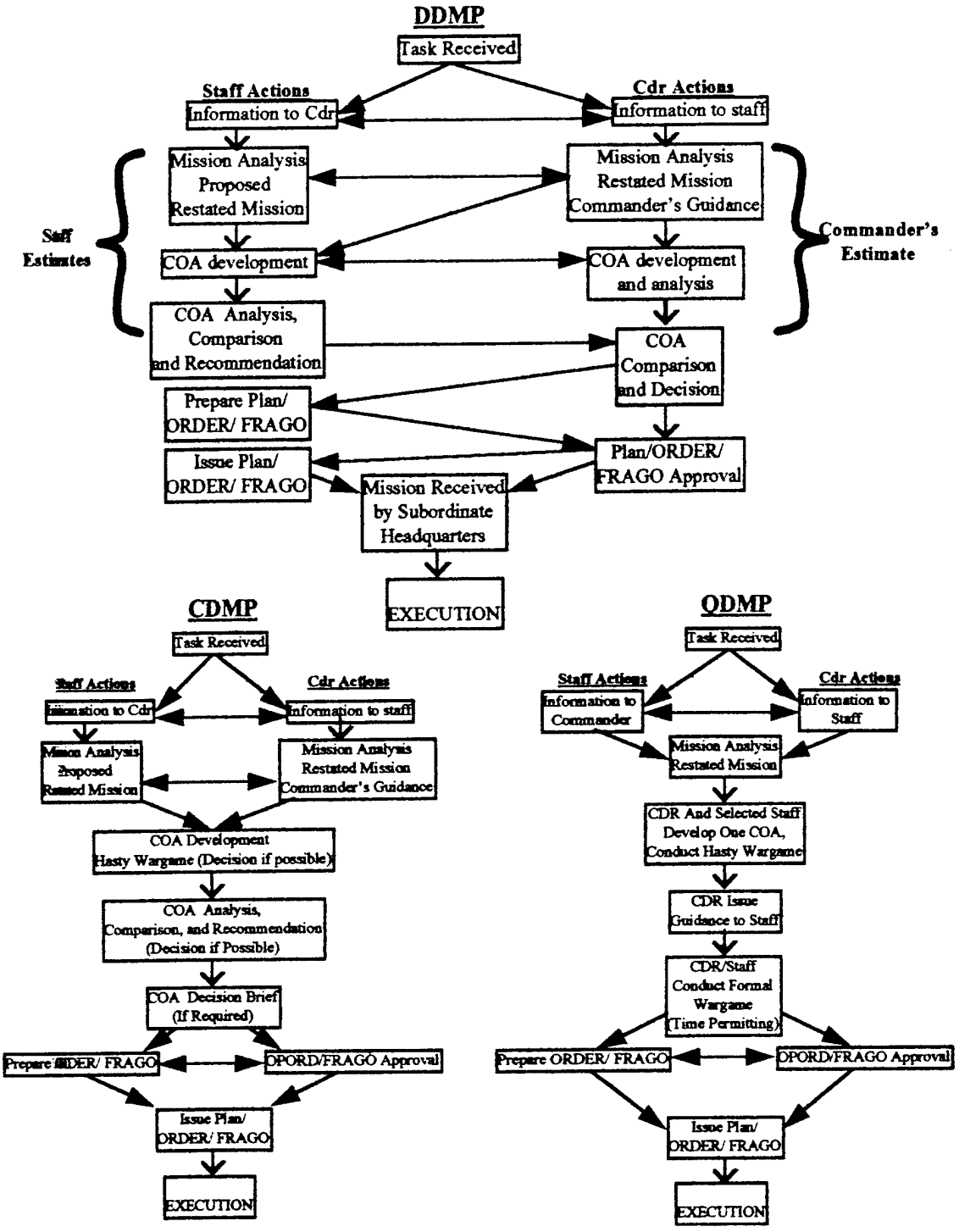

Figure 4- 2: Decision Making Processes[69]

Looking back at the section on the history of the decision making process, the intent was always to aid the commander in making a decision. The steps of the process were meant to provide the staff and the commander with an analytical method to arrive at a good decision. With the increased complexity of warfare, more steps and more written analysis products were added to the process. However, from the very beginning the doctrine continued to reiterate that the process depended upon the commander because he still had to make the decision in a timely manner.

If the Army intended to make the system easier and less confusing in 1993 by adding two new processes, then the changes did not accomplish their goal. Adding two new processes only introduced more confusion. This confusion led to the December 1995 newsletter by CALL which attempted to clarify the three processes and make them easier for the units in the field.[70]

While CALL was preparing that publication, it also realized that there was only one process. They thought that there was enough flexibility within that one process to handle the variances in time allowed to execute the process.[71] The key element was the commander's guidance. The commander had to focus the staff to provide him the help that he needed. The group responsible for rewriting FM 101-5 also realized that there was only one process and in the future edition of FM 101-5 there will only be the DDMP. According to LTC Harrington, Chief of Doctrine Production - Corps and Division Doctrine Directorate (CDD), "after wrestling with this over the last couple of years, we came to the conclusion that there is really only one process."[72] CDD believed that by

looking back at the history of the process, it was easy to see that the commander always had the flexibility to adjust the process for time.

From the beginning of the process back in the days of Prussian time, the process was almost completely mental relying on few if any written products. As the Army added more steps to the process and more people to the process because of complexity, the process tended to gravitate more and more to written products. However, the commander always was the final decision maker and he determined how much help the staff gave him.

Spectrum of Decision Making

The commander has to use his experience and judgment to determine how much input he gets from the staff. This is necessary because every situation is different. A commander can not come up with a lock-step method for making decisions because he will have to make decisions over a spectrum of conditions. Some of these factors are METT-T, the experience of the staff, and his own personal style.[73]

METT-T is the major factor influencing how much input the commander needs from his staff. If the mission is new and the commander has little or no experience with this type of problem, he will need more input from the staff. This is particularly true in some Operations Other Than War (OOTW) situations. If, however, the mission is an ongoing situation, the commander may not need as much help from the staff. If the enemy situation, the terrain and the troops available have not changed dramatically, the commander will not need a complete review of the situation with all of the written products. He may only need an update before he can make a decision. If, on the other hand, the situation is completely new, he may need the full process. Time is the other

factor of METT-T that may make a significant difference. If the commander has plenty of time he may want the whole process by the staff to confirm his own thought process. However, even if the commander needs the whole process, but he knows that the staff could not execute the full DDMP in time, he must prioritize for the staff those steps that he needs done to aid him in making a good decision.

The experience of the staff will also determine how much of the process the commander wants done. If the staff is inexperienced, the commander will have to make up for the lack of experience of his staff by doing more of the process himself. If the commander has a very experienced staff, they will be able to do the process almost as quickly as he can and give him the additional input of their specialized advice. The experience level of the staff will vary with the situation. If the type of situation is new, the staff will be inexperienced with the situation and will therefore be slower and more methodical. This will make the process take more time. The commander must take this into account when giving his guidance.

The commander's personality also impacts on decision making. If he is a very experienced commander, he may do more of the process himself to ensure that he gives more time to his subordinates to plan. He may also be the type of person who likes to hear a lot of advice from his subordinates before he makes a decision. If so, the commander will want a more detailed process. No two commanders are the same and each commander will need different input depending upon the situation.

It is vital that the commander understand the concept of the spectrum of decision making and realize that he controls the process. As FM 101-5 states "command requires

making and executing decisions regarding the generation, employment, concentration, and sustainment of combat power."[74] The commander is responsible for making decisions, he therefore needs to determine what he needs to make that decision. The staff and the DDMP are only tools to help him in accomplishing that requirement. If the commander does not understand the DDMP, and the spectrum of decision making open to him, he will not be able to maximize the staff in helping him arrive at a decision.

Shortening the Process

The hazard in returning to the doctrine of 1984 (with only the DDMP) is that the problem which caused the change in 1993 would still exist. As this report has pointed out, some commanders still do not know how to shorten the DDMP. According to Corps and Division Doctrine Directorate at FT. Leavenworth, there is an underlying assumption that commanders will have the experience necessary to shorten the process.[75] Given the current personnel rotation system, this experience at the tactical decision making process may not exist.

An officer gets his first in-depth indoctrination of the DDMP at Command and General Staff College (CGSC). At CGSC, officers are taught the DDMP in a very lockstep and full blown manner with all of the written products. This is done because the complete process is the one which requires the most work by the staff and lends itself best to classroom instruction. CGSC also believes that in order for a staff to adapt to a shortened process they must first understand the full process. CGSC has not taught the methods to shorten the process in the past because they did not have the time nor the asses to do it.[76]

After graduating from CGSC, most officers get limited experience with the process in the field. Officers after CGSC either get one year or less on division staff followed by one year as a battalion S3 or executive officer or they go straight down to battalions. In this time frame, they will get a limited number of opportunities to execute the process and then they will go off to do something else in the army. Most of the time that they are executing the process, they are being externally evaluated. This external evaluation keeps them from exploring the inherent flexibility in the system. Once these officers leave the battalion, they will have limited exposure to the DDMP in a tactical situation again until they return as battalion commanders. In the battalion commanders course, TCDC noticed a reluctance to shorten the process. TCDC determined that the commanders were reluctant to shorten the process because they felt that they did not have the experience to shorten the process.[77] This is the same problem which caused the Army to make the changes in the 1993 version of FM 101-5. By looking back at the history of the process and at the two processes added in 1993, one can see ideas on how to make the process shorter.

The key to shortening the process is in the commander's planning guidance. The commander tells the staff what he needs from them and what he expects them to do in helping him make a decision in his planning guidance. He provides guidance based upon his assessment of the spectrum of decision making. He quickly looks at METT-T, the experience of his staff, evaluates what he needs, and tells the staff. This report laid out the nine elements that the commander should address in his commander's guidance on pages 21 and 22. The more specific the guidance, the less time it will take the staff to comply.

The more general the guidance, the more time the process will take. The three areas where the commander can usually shorten the process most successfully are in COA development, COA analysis and whether or not the process is purely mental versus requiring a lot of written products.

COA Development

The number of COAs that are to be developed and considered has a direct impact on the amount of time that it takes to conduct the process. The commander can shorten the process by decreasing the number of COAs that the staff must develop (both friendly and enemy), by giving them explicit guidance on what to consider and what not to consider in developing a COA, and by specifying the COAs to consider.

The commander determines the number of COAs that he wants the staff to develop. The number of enemy COAs to be developed should be left up to the staff when there is plenty of time to give them maximum latitude, but the commander may want to specify the enemy COAs which he considers to be the most likely and the most dangerous. He can also give them the priority regarding which enemy COA he wants them to plan against.[78]

The commander can decrease the amount of time that it takes the staff to develop COAs by telling them what he will and will not consider in a suitable COA. This will provide focus for the staff.[79] It will narrow the options that they can consider. It will insure that when they brief the commander on their COAs that they have not included a concept that the commander will not consider.

The current doctrine does not give the number of friendly COAs that the staff should develop. The customary number is three. This comes from the 1940 version of FM 101-5 which stated that no more than two or three "lines of action" needed to be carried forward for further analysis. At the Command and General Staff College, Student Text 101-5 says that the number of COAs to be developed should be "manageable." The planner should develop two or three as a minimum. The ultimate goal should be several COAs for each enemy COA. However, if time is limited the commander specifies the number of COAs and which enemy COA they will address.[80]

The commander can reduce planning time by giving the staff the COA. As in the CDMP and the QDMP, if the commander gives the staff the COA, then the staff does not have to develop the COA. The staff needs to ensure that the COA is suitable, feasible and acceptable before they issue the warning order to subordinate units. This allows for parallel planning to begin at the next lower level. The act of parallel planning will decrease the overall planning time for the organization.

COA Analysis

The commander can decrease the amount of time which the planning process takes by decreasing the amount of wargaming that the staff must do. Units wargame for primarily three reasons: to analyze a COA for a decision, to synchronize the COA for the plan and to identify possible branches and sequels for further analysis. It takes between 45 minutes and 1 hour for a good staff to wargame a single COA against a single enemy COA.[81] The staff must do a complete wargame on the chosen COA in order to fully

develop the plan. However, if they can reduce the amount of wargaming necessary to recommend a COA, they will decrease planning time.

The more COAs that the commander wants wargamed, the more time the staff will take. If the commander only has them wargame a couple of COAs against the most likely enemy COA, then that will take less time than if they have to wargame three COAs against the enemy most likely and most dangerous COAs.

Another technique for reducing the time is to conduct a hasty rather than a deliberate wargame of the COAs. In a hasty wargame the staff only considers the critical events of each COA in order to be able to conduct the later comparison of the different COAs. This technique is being taught to newly selected battalion and brigade commanders at the Tactical Commanders Development Course (TCDC).[82] Since this method only wargames the critical events, it takes less time than a deliberate wargame. The disadvantage to this method is that once the commander has decided on a COA, the staff needs to go back and complete the wargame on the chosen COA. This is necessary to ensure that the plan is fully synchronized.

If the commander wargames possible COAs in his head and uses his experience to determine the chosen COA, he can substantially reduce the amount of time in analyzing COAs. In this case the staff only has to wargame the one COA. The commander will do this when time is essential or when one COA seems to be obvious given his experience and he wants to maximize the synchronization effort.

Mental versus Written

The fewer written requirements the commander requires before making a decision, the shorter the process will be. The problem is that the likelihood of error increases for work that is purely mental. Sometimes the simple act of writing can cause an individual to explore aspects that he would not have if he was not writing down his thoughts. Also, if the step was only done mentally, it is not very likely that someone will detect any error made.

The commander can further save more time by doing the entire process in his head. He is the most experienced officer and has seen the most possible solutions. The problems with this technique are that he may not have all of the information that he needs to make the decision and he is susceptible to making mistakes. The more the commander involves the staff, the more expertise and viewpoints he brings to bear on the problem. This reduces the risk of failure. However, the commander still must make the decision in time. If there is a higher risk of failure because a decision is not made quickly, then the commander must make the decision on his own.

Section V: Conclusions

"In itself, the danger of a doctrine is that it is apt to ossify into a dogma, and to be seized upon by mental emasculates who lack virility of judgment, and who are only too grateful to rest assured that their actions, however inept, find justification in a book, which, if they think at all, is, in their opinion, written in order to exonerate them from doing so. - Major General J.F.C. Fuller[83]

The Army added two additional decision making processes to its doctrine in the 1993 version of FM 101-5. This was an attempt to answer the criticism that came from

the field. This criticism stated that the process was too rigid, too time consuming and that the units did not know how to shorten the process. This did not solve the problem because units still did not know how to use these new processes. A careful analysis of the three processes using the problem solving methodology shows that these are actually only one process with the commander determining how much help he will need from the staff.

Units were having problems with the process because doctrine inferred that by knowing the full process a commander would know how to shorten the process. This is not true because most commanders do not have sufficient experience with and do not fully understand the process. If the commander does not know the process, he will not know how to shorten the process.

The key to shortening the process lies in the commander's planning guidance. The commander must tell the staff what he needs in order to make a good decision. He must determine how many COAs will be developed and who will develop them. He must determine how many COAs will be wargamed or hasty wargamed and he must determine how much of the process he will do mentally. He must also be able to balance his need for information with the amount of time that he has to make the decision. Even if the commander does not have all of the information that he needs, he must still make the decision or the enemy will make the decision for him.

The Deliberate Decision Making Process has evolved over time to provide the commander with an analytical approach to decision making. The Prussians first felt this need to teach their officers how to think and make decisions analytically after their defeat by Napoleon. The Prussians realized that they could not count on having great

commanders. They had to train commanders to be ready for future conflict. These commanders had to know how to think and analyze situations. They had to have a staff which also understood the process and could aid their commander in reaching that decision. When the Prussians were able to do this they became the dominant land power of Europe.

Following the success of the Prussians, many countries, including the United States, began copying their methods. As war became more and more complicated, the United States Army added more steps and products to the process. The process eventually became an end in itself and some commanders forgot that the true purpose was to reach a sound military decision. The Naval War College had warned of this problem in 1936.

As we look to the advances that will be made in the 21st Century, we must insure that our decision making doctrine is fully understood by commanders and staffs alike. As the United States Army harnesses the power of the computer and funnels large volumes of information down to the tactical level, commanders must understand the flexibility of the process. Without a full understanding, the process will easily overcome commanders and they will not be able to handle all of the information that will be available to their tactical operations center.

Doctrine is meant to be descriptive, not prescriptive. As J.F.C. Fuller pointed out in his quotation cited above, military men have a tendency to take doctrine as dogma. If this happens, it is usually because people are looking for a means to cover their own lack of understanding. The DDMP is a decision making process which is meant to cover the

full spectrum of decision making. The process covers cases where the commander has as much time as he needs to plan and covers those occasions when the commander must make an immediate decision. It is vital that the Army insure that it teaches the use of the DDMP across the spectrum of decision making. If not, it will find its tactical commanders trapped inside a dogmatic process which will lead them to their Jena.

Endnotes

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[2] Carl von Clausewitz, On War, ed. and trans. by Michael Howard and Peter Paret, (Princeton, NJ: Princeton University Press, 1976), p. 102.
[3] Dr. James J. Schneider, "Cybershock: Cybernetic Paralysis as a New Form of Warfare," (FT. Leavenworth, KS: School of Advanced Military Studies, 16 June 1995), p. 5.
[4] Idem, "The Theory of the Empty Battlefield," JRUSI, (Sept. 1987).
[5] United States. Department of the Army. Field Manual FM 101-5: Staff Organizations and Operations (1984), Washington, DC: GPO, 25 May 1984), p. 5-4.
[6] James W. Lussier and Douglas J. Litavec, Battalion Commander's Survey: Tactical Commanders Development Course Feedback, (Alexandria, VA: U.S. Army Research Institute, Sept. 1992), p. 16-17.
[7] United States. Department of the Army. Newsletter 95-12: Tactical Decision Making: "Abbreviated Planning", (FT. Leavenworth, KS: Center For Army Lessons Learned, Dec 95), p. I-3.
[8] Alvin Toffler, The Third Wave, (New York: Bantam Books, 1980), p. 9.
[9] Ibid., p. 439.
[10] Alvin and Heidi Toffler, War and Anti-War, (New York: Little, Brown and Company, 1993), p. 51-52.
[11] Admiral William A. Owens, "The Emerging System of Systems," Military Review, (May-June 1995), p. 15.
[12] James C. Madigan, and George E. Dodge. "Battle Command: A Force XXI Imperative." Military Review, (Nov. 94), p. 36.
[13] U.S. Department of the Army, TRADOC Pamphlet 525-5: Force XXI Operations, (FT. Monroe, VA: Army Training and Doctrine Command, 1 August 1994), p. 1-5.
[14] Madigan, and Dodge, "Battle Command: A Force XXI Imperative," p. 36.
[15] (LTG) John E. Miller, "Force XXI- Vision For Change," Military Review, (May-June 1995), p.1. "The purpose of the Army's emerging information operations is to enable and enhance our soldier's and their leaders' abilities to see, decide and act at a tempo that overwhelms adversaries."
[16] Michael L. McGinnis, and George F. Stone. "Decision Support Technology." Military Review, Nov. 94, p. 69. "Over the past decade, the emergence of corporate computer-based ESS (executive support systems) has made a significant impact on executive work in information management, decision making, planning and control and mental modeling. ESS has broadened the executive's span of control, making it possible to flatten organizational hierarchy. It has also reduced staffing levels through office automation, sped up decision-making cycles and made organizations more flexible in responding to change."
[17] Madigan, and Dodge. "Battle Command: A Force XXI Imperative," p. 35.
[18] Tsouras, Warrior's Words, p. 199.
[19] United States. Department of the Navy. Sound Military Decision including the Estimate of the Situation and the Formulation of Directives, (Newport, R.I.: U.S. Naval War College, 1936), p. 1.
[20] Ibid.
[21] Michael Howard, War in European History, (Oxford, England: Oxford University Press, 1976), p. 86.
[22] Ibid., p. 95.
[23] Sound Military Decision, p. 1.
[24] Hew Strachan, European Armies and the Conduct of War, (London: George Allen and Unwin, 1983), p. 92.
[25] Hajo Holborn, "The Prusso-German School: Moltke and the Rise of the General Staff," in Peter Paret's, Makers of Modern Strategy, (Princeton, NJ: Princeton University Press, 1986), p. 283.
[26] Clauswitz, On War, p. 112.
[27] Michael Howard, The Franco-Prussian War, (London: Methuen, 1981), p. 23-24. "In their General Staff, a body whose object was to fulfil exactly this function: applying to the conduct of war a continuous intelligent study, analyzing the past, appreciating the future, and providing the commanders in the field with an unceasing supply of information and advice...the dispersal of armies on the march made possible by the railway and the telegraph, and the dispersal in battle made necessary by rifled firearms, threw a greater weight on subordinate commanders and created technical problems of supply and communication which had to be delegated to specialists and which only a trained expert could properly evaluate."

[28] Ibid., p. 24-25.
[29] Gunther E. Rothenberg, "Moltke, Schlieffen, and the Doctrine of Strategic Envelopment," in Peter Paret's, Makers of Modern Strategy, (Princeton, NJ: Princeton University Press, 1986), p. 301. "At its best, the Prussian general staff system institutionalized combat efficiency by ensuring that in a given situation different staff officers, educated to a common fighting doctrine, would arrive at approximately the same solution for making the most effective employment of available forces."
[30] Rex R. Michel, Historical Development of the Estimate of the Situation, (Alexandria, VA: U.S. Army Research Institute, Oct 1990), p. 3.
[31] Captain Roger S. Fitch, Estimating Tactical Situations and Publishing Field Orders , (Fort Leavenworth, KS: US Army Staff College Press, 1909), p. 1.
[32] Field Service Regulations, United States Army, 1910. (War Department, 1910. Article III, Orders; Composition of Field Orders), Paragraph 75, p. 59.
[33] Michel, Historical Development of the Estimate of the Situation, p. 4.
[34] Ibid., p. 5.
[35] Sound Miltary Decision, p. 42-43.
[36] United States. War Department. Field Manual 101-5: Staff Officer's Field Manual: The Staff and Combat Orders. (Washington, DC: War Department, August 1940), p. 125.
[37] Ibid., p. 126.
[38] Ibid., p. 128.
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[44] B. Don Farris II, "Defining A Combat Decision-Making Process at the Tactical Level of War and Operations Other Than War," (MMAS Thesis for the Command and General Staff College, Fort Leavenworth, KS, 1995), p. 14.
[45] United States. Department of the Army. Field Manual 101-5: Staff Officer's Field Manual, Staff Organization and Procedure, (Department of the Army, Washington, D.C., 19 July 1960), p. 53.
[46] Michel, Historical Development of the Estimate of the Situation, p. 6.
[47] United States. Department of the Army. Field Manual 101-5: Staff Officer's Field Manual, Staff Organization and Procedure, (Department of the Army, Washington, D.C., 14 June 1968), p. 6-1.
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[51] United States. Department of the Army. Field Manual 101-5: Staff Officer's Field Manual, Staff Organization and Procedure, Department of the Army, Washington, D.C., 19 July 1972, p. 5-2.
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[53] Field Manual 101-5, May 1984, p. 5-4.
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[55] United States. Department of the Army. Newsletter 93-3: The Battalion and Brigade Battle Staff, Ft. Leavenworth, KS: Ceneter For Army Lessons Learned, 1993.
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[57]Tsouras, Warrior's Words, (New York: Sterling Publishing Co., 1992), p. 22.

[58] United States. Department of the Army. Field Manual 101-5: Command and Control For Commanders and Staff (Final Draft), (Washington, DC: GPO, August 1993). Since this section is a presentation of the doctrine as explained in this book, any authoritative comments will be from this publication unless otherwise footnoted.

[59] Ibid., p. 4-73.

[60] Specified tasks or those tasks which are stated in the order. Implied tasks are those tasks which must be conducted by the unit but which are not stated in the order. Essential tasks are those tasks which must be accomplished in order for the unit and their higher headquarters to succeed. United States. Department of the Army. Ibid., p. 4-12.

[61] Suitable means that the COA accomplishes the mission and meets the commander's guidance. Feasibility means that the unit can accomplish the mission in the specified time with the resources available. Acceptability is an assessment of whether the projected costs justify the means. Distinguishability means that each COA is significantly different from the others. Completeness means that the COA addresses the who, what, where, when, and how of the operation. Ibid., p. 4-26.

[62] Ibid., p. 4-83.

[63] Time measurements are based on technical capabilities and historical data. They are used to calculate estimated event duration. Space analysis is done to ensure that proper ground and air space exist to conduct the operation. Means analysis ensures that enough combat power is present to accomplish the task. Ibid., p. 4-50 to 4-51.

[64] Ibid., p. 4-72.

[65] Tsouras, Warrior's Words, p. 435.

[66] Dereck Miller, "What's the Problem? Mission Analysis in Operations Other Than War," (Monograph for the School of Advanced Military Studies United States Command and General Staff College, Fort Leavenworth, KS, 1995), p. 7.

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[68] George C. Brabb, Introduction to Quantitative Management, (New York: Holt, Rinehart and Winston, 1968), p. 4.

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[75] Interview with LTC John L. Harrington.
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