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The Division Level Military Decision-Making Process (MDMP): Design and Development of a Prototype Computer-Based Training Product

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14. ABSTRACT *(Maximum 200 words)*:

This report documents the analysis, design, and development of the Division Level Military Decision-Making Process (MDMP) training product. The division level MDMP product is a computer-based, stand alone training support package envisioned to be used by the U.S. Army Command and General Staff College (CGSC) to augment existing CGSC instruction on the MDMP. The product, a computer disk, provides a self-paced, detailed discussion of the steps of the MDMP, focusing on the battle staff at the division-level. Field Manual 101-5 Staff Organization and Operations served as the doctrinal source reference. The course also contains selected tactics, techniques, and procedures (TTP) that aid the CGSC student in conducting staff integration and coordination during mission planning. This project was coordinated with the CGSC.

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FOREWORD

The military decision-making process (MDMP) is a proven analytical process consisting of cumulative and sequential steps. It involves the entire command and battle staff at every level, in planning and implementing battlefield strategies. Effective decision-making can be achieved by commanders and their staffs who utilize the MDMP, which progressively guides them through each step of the process, ultimately leading to production of orders. However, it is necessary that these commanders possess a complete understanding of the MDMP before it can be effectively employed.

Deficiencies in the use and understanding of the MDMP by battalion and brigade commanders have been repeatedly identified during Combat Training Center rotations. This problem was addressed in 1998, when the U.S. Army Research Institute (ARI) for the Behavioral and Social Sciences' Infantry Forces Research Unit (IFRU) at Fort Benning, GA, initiated a prototype computer based instruction (CBI) module for the Joint Readiness Training Center (JRTC) Leaders Training Program. This CD-ROM provided self-paced, stand-alone instruction in an abbreviated version of the MDMP to light infantry brigade staff. Upon viewing the JRTC MDMP, the Center for Army Tactics, U.S. Army Command and General Staff College (CGSC) at Fort Leavenworth, KS, requested that IFRU modify the JRTC MDMP to assist in training division-level officers.

This report documents the design and development of the Division Military Decision-Making Process prototype training program. Unlike the JRTC MDMP, this CBI module encompasses the entire MDMP doctrine, including detailed examples of tactics, techniques, and procedures that improve individual and staff decision-making. The prototype CD-ROM will be disseminated by CGSC.

Zita M. Simitus

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THE DIVISION LEVEL MILITARY DECISION-MAKING PROCESS (MDMP): DESIGN AND DEVELOPMENT OF A PROTOTYPE COMPUTER-BASED TRAINING PRODUCT

EXECUTIVE SUMMARY

Research Requirement:

To address deficiencies in training of division-level officers in the military decision-making process (MDMP), the U.S. Army Research Institute, Infantry Forces Research Unit (IFRU), initiated the development and design of an interactive computer-based instruction (CBI) module on CD-ROM. This self-paced, stand-alone program is intended to augment training practices already utilized by the Center for Army Tactics, Command and General Staff College (CGSC), at Fort Leavenworth, KS. In providing instruction to the division-level students of the MDMP, it was necessary to include a doctrinal overview, as well as specific courses of action for division-level commanders and staff officers making tactical decisions. The development of this program, in CBI format, was the direct result of a need identified by CGSC.

Procedure:

This training product was developed in response to a specific request by CGSC, to augment existing training. The training material was designed to provide comprehensive instruction on the MDMP at the division level, and was developed in accordance with the revised FM 101-5 (1997). The CBI module consists of seven lessons that correspond to the seven steps in the MDMP. Each lesson begins with a doctrinal overview, then proceeds to specific and detailed descriptions and examples of the decision-making process for each major staff division (e.g., G1, G2, G3, G4, G5, and G6). Lessons may be accessed in any order, although it is recommended that they be taken in sequence. All examples are portrayed as relating to division-level command decisions.

Aside from doctrinal information adapted from FM 101-5, considerable input was received from CGSC subject matter experts, as well as from previous IFRU research products.

Findings:

The Division MDMP should be a useful adjunct to CGSC instruction of division level officers. This unique training product provides the most comprehensive instruction in the MDMP that is currently available, outside of FM 101-5, and should greatly improve user understanding of the decision-making process. The stand-alone design of each step's instruction will enable more advanced users to identify and concentrate on specific areas of deficiency, or

will allow novice students of the division level MDMP to gain a better understanding of the sequential and cumulative nature of the entire process. With minor revision, this program could provide a useful training tool for any level of instruction in the MDMP.

Utilization of Findings:

The division level MDMP CD-ROM will be reproduced and disseminated by the CGSC, to both resident and non-resident CGSC students, to augment existing instructional practices and training materials.

THE DIVISION LEVEL MILITARY DECISION-MAKING PROCESS (MDMP): DESIGN AND DEVELOPMENT OF A PROTOTYPE COMPUTER-BASED TRAINING PRODUCT

CONTENTS

LIST OF FIGURES

The Division Level Military Decision-Making Process (MDMP): Design and Development of a Prototype Computer-Based Training Product

Introduction

Decisions are the means by which the commander translates his vision of the end state into action. As the primary decision-maker within a unit, the commander, along with the assistance of his staff, must not only decide what to do and how to do it, he must also recognize if and when he must make a decision. As Adolf von Schell pointed out, "It is often more difficult to determine the moment for making a decision than it is to formulate the decision itself" (Schell, 1933, p. 55). "Decision-making, therefore, is knowing if to decide, then when and what to decide, as well as understanding the consequences of the decision" (Field Manual (FM) 101-5 Staff Organization and Operations, Headquarters, Department of the Army (DA), 1997, p. 5-1). To be effective, decision-making must be a total staff effort with one objective - to collectively mesh information and intelligence with sound tactical and technical competence, producing flexible plans. This, in turn, enables the commander to consistently make better decisions than he could without his staff.

The thought process for examining the battlefield is called the military decision-making process (MDMP). It is an adaptation of the Army's analytical approach to problem solving. The MDMP is a single, established, and proven analytical process. It comprises a series of actions, changes, or functions that achieve an end result. Each step of the process begins with certain input that builds upon the previous steps. Each step, in turn, has its own output that drives subsequent steps. In military decision-making, the mission received by the commander initiates the decision-making process.

Background

The U. S. Army Research Institute for the Behavioral and Social Sciences (ARI) has conducted research on various training strategies for preparing individual and staff groups to perform their combat tasks. The Infantry Forces Research Unit (IFRU) at Fort Benning, GA, began with an effort to identify staff training needs and critical functional skills at the battalion level (Thompson, Thompson, Pleban, & Valentine, 1991). This effort was followed by the identification of commander and staff critical combat skills at the battalion and brigade levels (André & Valentine, 1996; .Pleban, Thompson, & Valentine 1993).

The focus on staff synchronization continued into the development of critical tasks for selected text and computer-based training (CBT) training support packages for battalion and brigade staff officers (André & Salter, 1996a, 1996b). Capitalizing on CBT as an educational learning vehicle for staff synchronization, IFRU initiated a prototype training product for the MDMP (Wampler, Centric, & Salter, 1998). This CBT MDMP project, developed for the Leaders Training Program (LTP) at the Joint Readiness Training Center (JRTC), provided the light infantry brigade staff an abbreviated view of the MDMP process. The CBT did not concentrate on the process itself, rather providing an overview

while simultaneously offering selected collective and individual tactics, techniques, and procedures (TTP) designed to improve staff performance.

In early 1998, the Center for Army Tactics, U.S. Army Command and General Staff College (CGSC), Fort Leavenworth, KS, obtained a production copy of the JRTC MDMP. They approached IFRU with a request to check the feasibility of modifying the JRTC MDMP instruction to help division-level staff officers. The CGSC request was based on their analysis that some combat arms officers and many of the low-density divisional special staff officers, (e.g. finance officers, chaplains, transportation officers, aviation officers, and engineers), did not fully understand the MDMP process. As envisioned, then students would use a division-level product to augment existing CGSC instruction. The CBT format would permit this to occur without the need to rededicate valuable existing classroom time.

Statement of the Problem

A recurring collective training deficiency has been that "unit staffs frequently misuse, cannot use, or do not understand the MDMP" (Battle Command Battle Laboratory [BCBL], 1995, p. 1-4). Analysis of observations from focused Combat Training Center (CTC) rotations further confirmed that battle commanders regularly did not use the decision-making process as it was designed, because they did not *understand the process* (BCBL, 1995). Repeated CTC observations, notably at JRTC and the National Training Center (NTC), have reinforced the position that battalion and brigade commanders and staffs frequently lack the ability to properly conduct the MDMP. In fact, NTC specifically noted consecutive recurring deficiencies in battalion command and staff execution of the MDMP from the 1st Qtr, FY95, through the 2d Qtr, FY97, characterizing the problem as "Battle staffs lack the training required to conduct the military decision-making process" (Center for Army Lessons Learned, 1997, p. N-124).

The lack of unit training on the MDMP is further complicated by the evolutionary nature of the MDMP. The MDMP is extremely fluid, undergoing several major changes in the past several years. For example, in 1993, CGSC published Student Text 100-9 which provided a detailed description of how to conduct the then "tactical decision-making process" (TDMP) (CGSC, 1993). The epoch of its development culminated with a 1995 CGSC edition of the TDMP (CGSC, 1995). Both the 1993 and 1995 versions discussed a four-phase process which included three models (deliberate, combat, and quick). Each model was used separately, dependent on the amount of available staff planning time. The 1995 TDMP expanded the number of substeps within each phase, adding many details to the process.

The latest version, found in Chapter 5 of FM 101-5 (DA, 1997), redefines the TDMP as the MDMP. It identifies a seven-step model, which builds upon the analyses of each of the previous steps, culminating in the production of orders. The earlier three-model concept has been replaced with a single-model process that is abbreviated by the commander when critical planning time is short. However, many of the detailed examples of how to accomplish specific subtasks and the TTP contained in the earlier versions, were

not included in the subsequent (1997) publication of FM 101-5. For example, the linkage between the decision-making process and troop-leading procedures (TLP), a mainstay in mission planning, is now obscured, if not lost, to most readers.

To compound the problem, there are now several substeps that only discuss a concept without any explanation of how to accomplish the corresponding task. For example, the third step of the MDMP, Course of Action Development, has six substeps. Of these, the fifth substep is to assign headquarters to the initial array of friendly forces. There is no mention of how to visually display on a map the assignment of a headquarters to a grouping of generic subunits, two levels down. The technique used in the earlier TDMP was to draw a unit symbol annotated with the appropriate unit size of the headquarters. A circle was then drawn around the generic subunits to indicate that these units belonged to a specific headquarters. This technique also helped the planner when he completed the next substep, Develop a Scheme of Maneuver. During this substep, generic subunits are converted into specific-type units, required to accomplish the mission.

Potential Difficulties

An inherent difficulty in developing a division-level version of the MDMP is that the division staff is a rather large organization. A means to involve the low-density special staff officers into the process, yet within a tailored product, had to be found. Any discussion that covered the actions of all participants would be time-consuming and cumbersome. Time and funding constraints would have to be major considerations. Additionally, the participants and with and for whom they interact, vary within each division. Furthermore, no doctrinal interfaces or TTP exist for most of the low-density special staff officers.

Design and Development

Coordination

The training value of CBT, particularly as a self-paced, independent study tool, has been well-documented (André, Wampler, Olney, 1997; Fletcher, 1995). Since CGSC was an Army customer, the course development process used was the Army's Systems Approach to Training (SAT) model. U.S. Army Training and Doctrine Command (TRADOC) Regulation 350-70 (TRADOC, 1996) requires all Army trainers to apply the SAT process in making training decisions. TRADOC Pamphlet 350-70-2 (TRADOC, 1996a) was used to provide guidance for the design and development of multi-media and interactive courseware instruction.

Revised project milestones (significant events within the production schedule that have to be met at a specific time) were established early in the design phase. These included an initial storyboard review, a final storyboard review, final compact disk (CD) approval, and a research report. A storyboard is a graphic depiction of a single frame or a series of frames arranged sequentially. It describes the action or navigational branching and content of the interactive courseware. It also specifies the graphics or visuals,

narration, any video or audio requirements, animation, or special effects. Finally, the storyboard serves as the audit trail for the course since the various participants (training developers, narrators, audio-visual personnel, and programmers) annotate all actions taken at the various production stages directly onto the storyboards.

It was agreed that CGSC subject matter experts (SMEs) would conduct the initial draft storyboard review. The IFRU and the CGSC SMEs would then conduct separate final storyboard reviews. Reviews of the subject matter for accuracy and adherence to doctrine, general grammar and punctuation, and proper functioning of the navigation branching were conducted. Additionally, before each Government review, the contractor examined storyboards to ensure instructional soundness, doctrinal accuracy, completeness, and administrative correctness. A contractor quality assurance review was conducted once the CD was cut to ensure that the course operated as designed.

It was also determined that the most expeditious means of coordination was telephonic discussions between the contractor's training developer, the IFRU, and the CGSC SMEs. The preliminary discussions proved particularly fruitful in narrowing the project's scope and clearly defining the customer's needs. They also served to establish the contractor's workload and deliverable products. These discussions were followed up in writing to avoid misunderstandings and by a formal coordination meeting.

As a result of these discussions, the military customer (CGSC) decided on many of the SAT model inputs. It was CGSC's decision to use CBT as the training vehicle. No further needs analysis was required since the CGSC request was based on their own analysis of the training problem. The target audience, students attending CGSC, was also well defined. This determined both the educational outcome and training level. Additionally, since the CBT was to be designed to augment existing instruction, there was no need for any formal end-of-training evaluation or implementation phase. The scope of the project was also clearly defined. The CBT product would be 100% CBT, focusing on the MDMP (in accordance with the revised FM 101-5) at division-level. Unlike the JRTC MDMP, a heavy division would be used for all examples and practical exercises. Existing CBT was to be used as the base product.

In preparing for these discussions, the contractor developed a course outline of the proposed training materials that was provided to the CGSC prior to telephonic discussions. In this way, the CGSC SMEs were better able to visualize the flow of the instruction as it was presented to them. This technique also permitted the customer to influence the development of the instruction prior to material production and resolve potential differences in training techniques.

At the coordination meeting, the training developer was able to demonstrate the proposed content and flow of the course. Using draft storyboards, the training developer and the CGSC SMEs reviewed the content of several of the individual lessons together. Additionally, the training developer provided a CD with full color representations of the final graphics for each slide. As each storyboard was discussed, the training developer selected the matching graphic for an immediate CGSC SME review. Comments and

proposed changes to content and graphics were annotated directly on the draft storyboards. In six hours of direct review, three weeks of production time were saved, eliminating mailing and review time back and forth. Three of the seven proposed lessons were handled in this manner. The training developer subsequently made corrections to these lessons, and returned them along with the remaining lessons to complete the requirement for the initial storyboard review. The coordination meeting dramatically reduced the SME review process and confirmed customer expectations, the two major goals of the coordination meeting. The other lessons were reviewed by the CGSC and returned for corrections as needed.

Course Design

The course was designed with seven lessons, each corresponding to a step in the MDMP. The lessons were designed to be stand-alone and could be taken in any order, although it was suggested that students follow the sequence of the MDMP. A course introduction was added to serve as an overview and the branching vehicle for each of the lessons, so a student can move to one of the lessons, then return to the introduction to review additional information. Two critical topics that did not fit into the separate lessons were included in the introduction. These topics were the roles of the commander and staff in the MDMP and how to abbreviate the process in a time-constrained environment. (Figure 1 shows the course structure.)

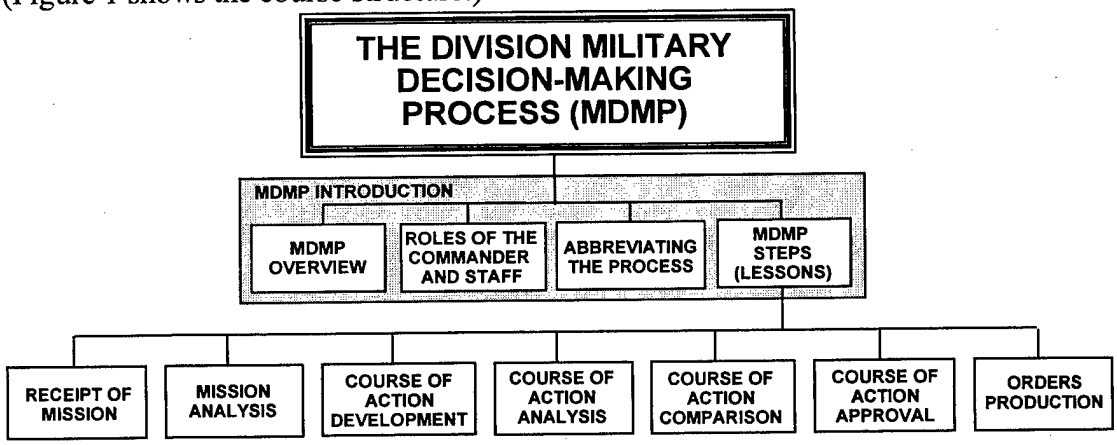


Figure 1. Division MDMP course outline.

Unlike the earlier JRTC MDMP, the division MDMP course encompassed the entire MDMP. Each step was extremely detailed to aid the uninitiated student. The use of optional navigation branching buttons was increased to provide these students with additional information and practical exercises to aid in their learning. More advanced students, those with a better understanding of these concepts, were able to by-pass this information.

Critical collective and individual TTP were added directly into the corresponding process steps, as much as possible. However, TTP were still clearly identified to differentiate between doctrine and technique. Figure 2 shows an example TTP integrated into the lesson flow.

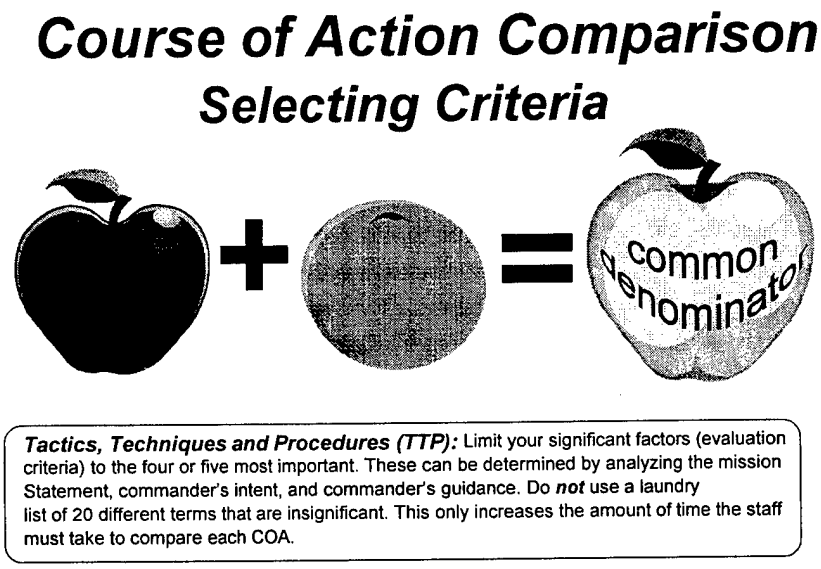


Figure 2. Sample TTP integrated into the lesson flow.

As mentioned earlier, much of the detail provided in earlier MDMP models has been eliminated from the latest doctrinal sources. The 1993 version of ST 100-9 contained 226 pages, plus appendixes, devoted to the decision-making process. The current version of FM 101-5 dedicates the 31 pages of Chapter 5 to the decision-making process, plus Appendix H to plans and orders. Many of the accepted and once commonly shared methodologies of "how to" accomplish a given task are now left up to the individual, who has to figure out how to accomplish the task.

For this division level MDMP training product, some of the critical "how to" information was reinstalled under the guise of TTP. For example, during Course of Action Development, the planner is asked to array friendly forces on a map in order to visualize how to determine the necessary forces. These forces are generic at this stage. No guidance is provided for accomplishing this task. A solution was found in the earlier printed versions of the decision-making process. Labeled as a technique, military symbols for battle positiόns (replicating units two levels down) were overlaid onto a map to aid the planner. This technique was continued throughout the various Course of Action Development steps. See Figure 3 for a sample of arraying generic forces.

A TTP was also used for the follow-on steps, arraying additional generic forces to obtain battlefield depth, adding additional control measures and type-classifying the

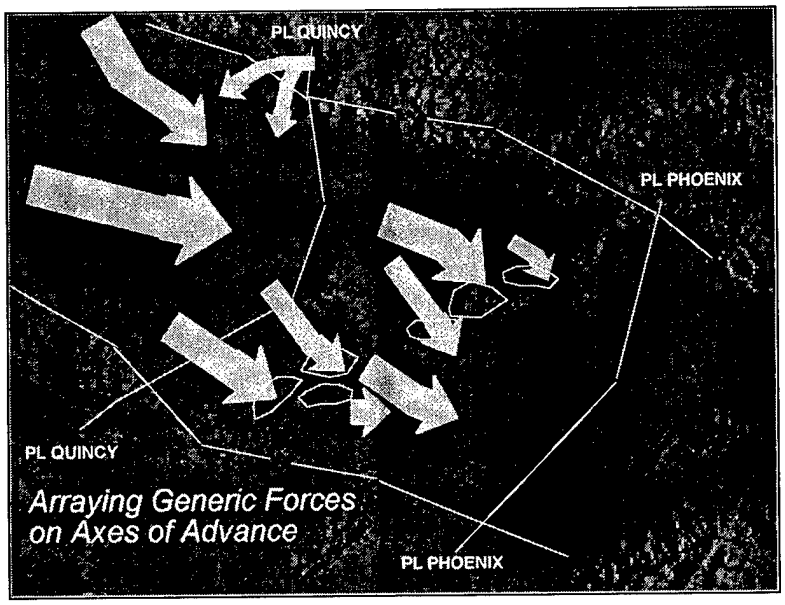


Figure 3. Arraying generic forces.

generic units, and assigning headquarters. The revised MDMP explains the process, yet does not offer the reader a means of accomplishing the task. In the earlier MDMP versions, generic unit symbols were used. These unit symbols were modified and refined as each substep was accomplished. By reintroducing the unit symbol technique, the student can better visualize each substep as well as the process flow. Naturally, there are other means, but this technique had proved successful in the past. Figure 4 provides an example of adding additional control measures and converting generic forces to type-specific units.

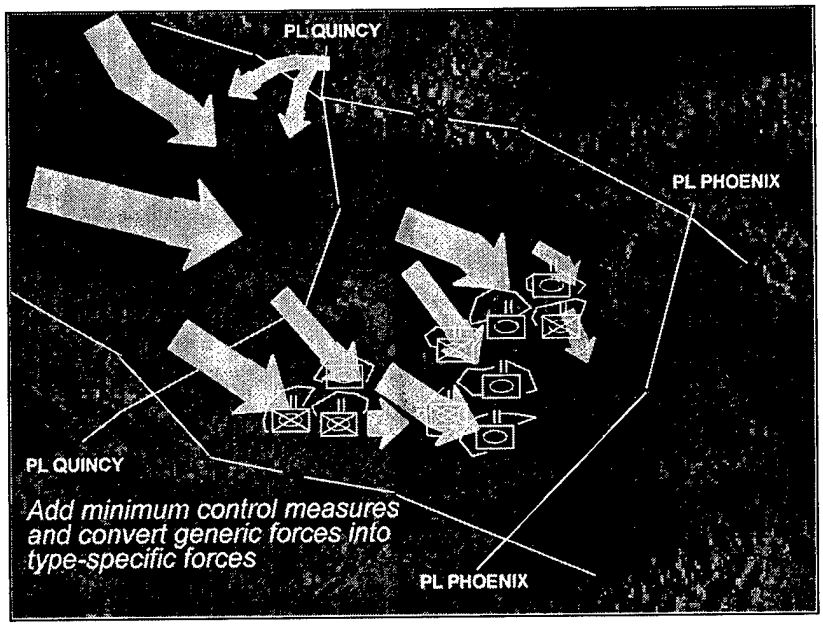


Figure 4. Example of adding minimum control measures and converting generic forces into type specific forces.

The use of standardized formats and slides helps students to visualize where they are within a course and to identify critical information. Examples include standardized introduction slides, menus, and end of lesson slides. For that reason, all seven lessons were structured in the same manner. Each of the lessons began with a doctrinal overview that captured the steps for that lesson and culminated with the staff products associated with that step. A second section encompassed the steps for that lesson. These include the actions, steps, and products that must be developed by the commander and staff to complete that particular step in the MDMP. As stated earlier, TTP that fit into the flow of the instruction were included into the body of the lesson. The placement of TTP in the lesson often resulted in providing the integration linkage mentioned in the lesson, providing one or more valuable suggestions on how to accomplish a specific task.

The third section of each lesson lists specific staff officer-related TTP. In the earlier JRTC MDMP, the preponderance of the lesson TTP were listed as possible actions for a specific staff officer. Most of the division level MDMP TTP were included directly into each lesson. The TTP that did not fit within the flow of the lesson, but contained important information, were listed under the specific staff officer position. The net result was that this section was significantly reduced from that of the JRTC MDMP. Navigational branching menus were used to allow the student the option of taking sections in any sequence. Figure 5 is an example of a lesson navigational branching slide.

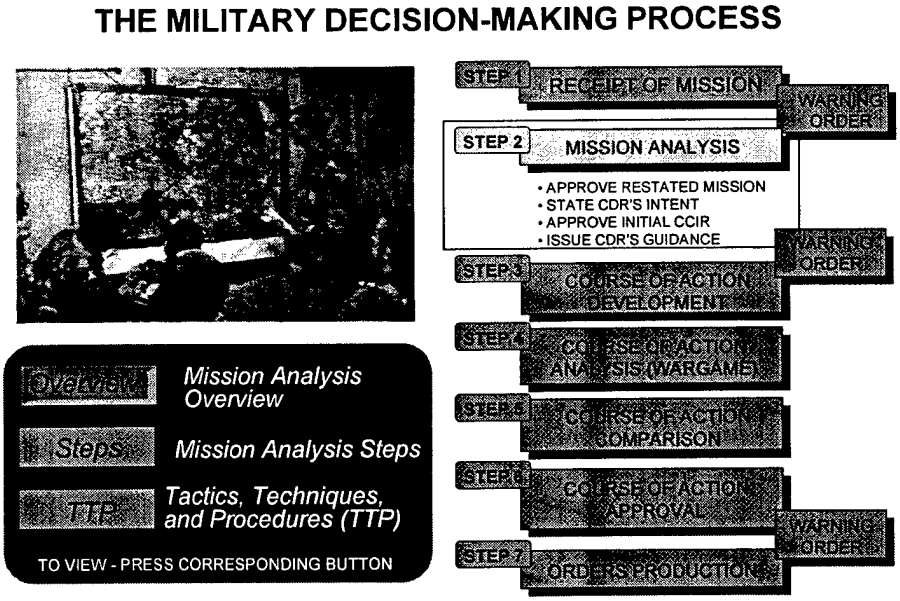


Figure 5. Example of a lesson navigational branching slide.

As stated earlier, the doctrinal overview is based on the 1997 version of FM 101-5. The review was designed to be a three to four slide overview of each particular step in the MDMP process. It provides the staff officer taking the instruction a snapshot of what steps and products the entire staff is preparing in order to complete this step in the MDMP.

Figure 6 is a sample slide containing this doctrinal material. It shows a screen from Lesson 5 that depicts the doctrinal guidance for that step, Course of Action Comparison.

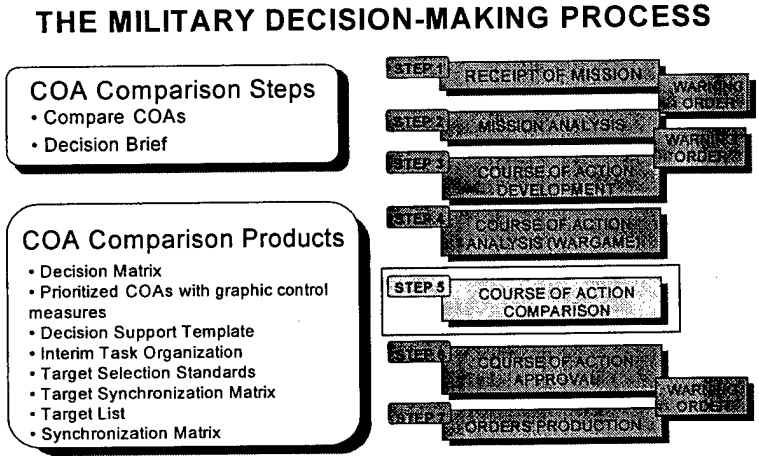


Figure 6. Sample of doctrinal information contained in the lesson overview.

Where information was presented about the facts and assumptions gathered by the staff, the information was centered on the command decision and staff actions of the division commander, chief of staff, and the actions of the major coordinating staff sections within the division (G1, G2, G3, G4, G5, and G6), as shown in Figure 7. Low-density special staff officers were instructed to continually ask themselves two questions as they

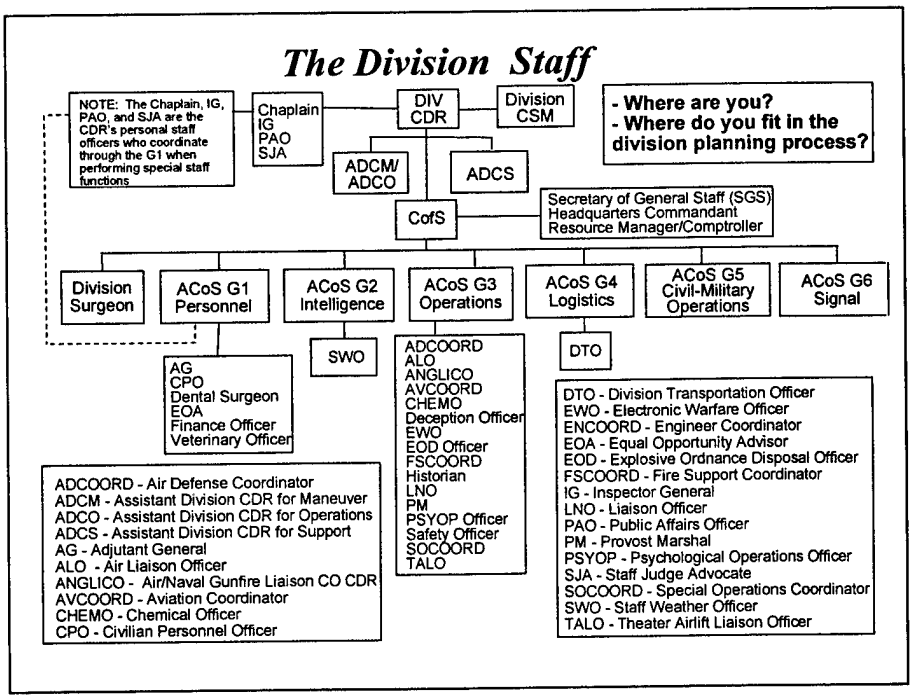


Figure 7. The division staff organization.

progressed through the instruction: Where do I fit into the staff and where do I fit into the planning process? By answering these two questions, the low-density special staff officers were able to gauge how each segment of the instruction impacted them within the divisional staff structure. Products and staff coordination points of contact were more readily identified since all staff efforts focused eventually through these principal staff officers.

As with the JRTC MDMP, extensive sample forms were liberally provided to assist the staff officers in performing their roles within the MDMP. These forms included not only those forms used by individuals, but included common forms used by the collective staff. In each instance, instructions were provided on the use of each form. Additionally, variant samples were provided whenever possible with the goal that these officers would incorporate the ideas used by other units into their own analysis. Figure 8 provides an example of one of several decision matrix formats.

Course of Action Comparison

The Decision Matrix

DECISION MATRIX
MISSION (TASK)
DELIBERATE ATTACK

COAs / CRITERIA [1]	WEIGHT	COA 1	COA 2	COA 3
FLEXIBILITY	2	( )	( )	( )
AGILITY	1			
CONCEN-TRATION	2	( )	( )	( )
DEPTH	1			
SIMPLICITY	1			
COMMAND & CONTROL	2	( )	( )	( )
SUSTAIN-ABILITY	1			
TOTAL [2]		( )	( )	( )

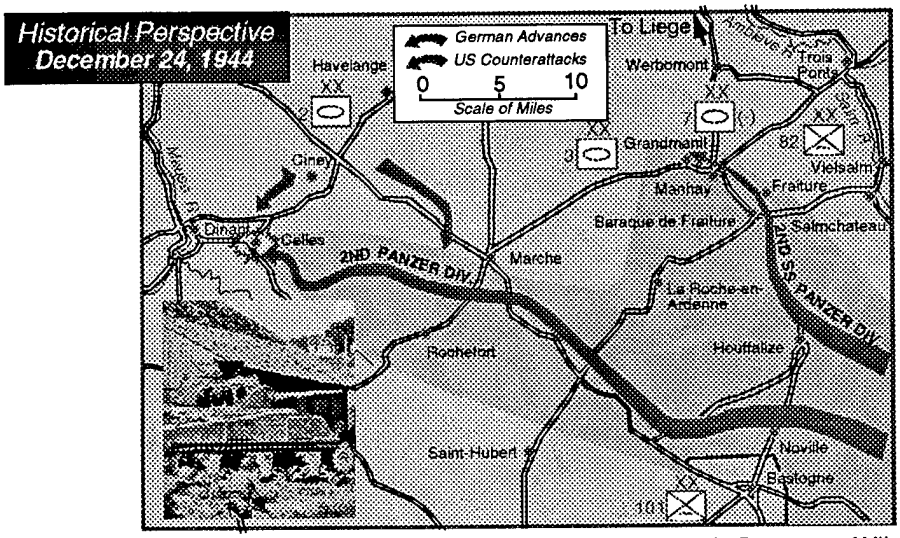
1 SUBJECTIVE STAFF ANALYSIS
2 LOWEST TOTAL IS BEST OPTION

AS OF _____

Figure 8. An example of a decision matrix used for course of action comparison.

The use of historical perspectives has always been an excellent means of reinforcing a teaching point or concept. Extensive use of historical perspectives was made in the division level MDMP. Figure 9 is an example of an historical perspective used to reinforce the concept of initiative. In this example, Major General Harmon, Commander of 2d Armored Division under VII Corps, was in defensive positions along the northern flank of the German penetration. Harmon had been under instructions by his superior, Field Marshal Montgomery, to avoid contact with German forces until the American lines in the

Bulge could be "put in order". The Second Panzer Division, spearheading the German northern advance, bivouacked near the town of Celles. Major General Harmon realized that the German unit was totally unaware of the close proximity of 2d Armored Division and pushed VII Corps headquarters hard for permission to counterattack. By regaining the initiative, 2d Armored Division's successful counterattack ultimately resulted in halting the western expansion of the German operation.



The "Battle of the Bulge" had been ongoing since December 16th. The 2d AD, as part of VII Corps, was in defensive positions along the northern flank of the German penetration. Major General Harmon, receiving reports of German tanks approaching, requested permission to counterattack on favorable terrain around the town of Celles. His quick actions stopped the vanguard of the German offensive, and ultimately the expanding German penetration.

Figure 9. Use of a historical perspective to reinforce the concept of initiative.

Conclusions and Recommendations

The division level MDMP computer-based training product, as designed for CGSC, will be reproduced and distributed by CGSC to augment existing instruction. Although the material was designed for use by divisional staff officers, the instruction provides a detailed discussion of the MDMP. This instruction is not provided anywhere else, in any other medium, other than the instruction that is contained in FM 101-5. The JRTC MDMP CD does not include a complete discussion of the MDMP process, but rather focuses on the TTP within each step. Thus, this product, the Division MDMP CD-ROM training program, is unique.

This instructional material could easily be adapted for Army-wide training on the MDMP at any of the advance courses. The differences between light and heavy forces do not impact the process dramatically other than for planning considerations. Their differences could be discussed as supplementary material. Other changes might be to delete TTP specific to division staff officers, and to provide additional examples, useful to staff officers at various staff levels.

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Appendix A

Acronyms and Abbreviations

ARI	U. S. Army Research Institute for the Behavioral and Social Sciences
BCBL	Battle Command Battle Laboratory
CBI	Computer-Based Instruction
CBT	Computer-Based Training
CDR	Commander
CD-ROM	Compact Disc - Read Only Memory
CGSC	U.S. Army Command and General Staff College
COA	Course of Action
CTC	Combat Training Center
DA	Headquarters, Department of the Army
FM	Field Manual
IFRU	Infantry Forces Research Unit
JRTC	Joint Readiness Training Center
LTP	Leaders Training Program
MDMP	Military Decision-Making Process
NTC	National Training Center
PL	Phase Line
SAT	Systems Approach to Training
SME	Subject Matter Expert
ST	Student Text
TLP	Troop-Leading Procedures
TDMP	Tactical Decision-Making Process
TRADOC	U.S. Army Training and Doctrine Command
TTP	Tactics, Techniques, and Procedures