Study
Report
2002-06

The Multi-Skilled Soldier Concept: Considerations for Army Implementation

John T. Nelsen II
Booz Allen Hamilton

Allan Akman
Akman Associates, Inc.

United States Army Research Institute
for the Behavioral and Social Sciences

April 2002

Approved for public release; distribution is unlimited.

U.S. Army Research Institute
for the Behavioral and Social Sciences

A Directorate of the U.S. Total Army Personnel Command

ZITA M. SIMUTIS
Acting Director

Research accomplished under contract
for the Department of the Army

Booz Allen Hamilton

Technical Review by

Diana Tierney
Kathleen A. Quinkert

NOTICES

DISTRIBUTION: Primary distribution of this Study Report has been made by ARI. Please address correspondence concerning distribution of reports to: U.S. Army Research Institute for the Behavioral and Social Sciences, Attn: TAPC-ARI-PO, 5001 Eisenhower Ave., Alexandria, VA 22333-5600.

FINAL DISPOSITION: This Study Report may be destroyed when it is no longer needed. Please do not return it to the U.S. Army Research for the Behavioral and Social Sciences.

NOTE: The findings in this Study Report are not to be construed as an official Department of the Army position, unless so designated by other authorized documents.

REPORT DOCUMENTATION PAGE

1. REPORT DATE (dd-mm-yy) April 2002	2. REPORT TYPE Final	3. DATES COVERED (from. . . to) 07/03/2001 to 03/15/2002
4. TITLE AND SUBTITLE The Multi-Skilled Soldier Concept: Considerations for Army Implementation		5a. CONTRACT OR GRANT NUMBER GS-23F9775H 5b. PROGRAM ELEMENT NUMBER 20665803
6. AUTHOR(S) Nelsen, John T.,II (Booz Allen Hamilton) and Akman, Allan (Akman Associates, Inc)		5c. PROJECT NUMBER D730 5d. TASK NUMBER 6900 5e. WORK UNIT NUMBER C01
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) U.S. Army Research Institute for the Behavioral and Social Sciences 5001 Eisenhower Avenue Alexandria, VA 22333-5600		8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) Personnel Proponency Directorate, Office of the Deputy Chief of Staff, Training (ATTN: ATTG-P) Headquarters, U.S. Army Training and Doctrine Command Ft. Monroe, VA 23651-1049		10. MONITOR ACRONYM ARI 11. MONITOR REPORT NUMBER Study Report 2002-06

12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release; distribution is unlimited.

13. SUPPLEMENTARY NOTES
Dr. Elizabeth Brady, Contracting Officer's Representative

14. ABSTRACT *(Maximum 200 words)*:

The purpose of this study was to analyze the meaning and implications of the Multi-Skilled Soldier (MSS) Concept and to assess the considerations for Army-wide implementation in order to provide a basis to make decisions whether or not to proceed with realization of the MSS Concept and, if so, how. The specific objectives were to analyze the Concept and its implications generally for the Army and specifically for the Objective Force, to develop a Blueprint for use in defining and assessing potential MSS implementation and sustainment courses of action, to devise a Roadmap outlining major actions required for MSS implementation by 2008, to craft a Study Plan of research and analysis projects, including behavioral research, necessary to support MSS implementation and sustainment, and to make pertinent conclusions and recommendations. This study relied heavily on non-attribution interviews conducted from August 2001 through January 2002 with those involved in developing the concepts for the Objective Force and in fielding the initial Interim Brigade Combat Teams (IBCTs). This report serves as a departure point for further research and development work relating to crafting and assessing implementation and sustainment courses of action, as well as supporting personnel and training designs and associated best practices.

15. SUBJECT TERMS
multi-skilled soldier; objective force; competency-based training; initial entry training; military occupational specialty (MOS) redesign; MOS consolidation; interim force; distance learning

SECURITY CLASSIFICATION OF			19. LIMITATION OF ABSTRACT	20. NUMBER OF PAGES	21. RESPONSIBLE PERSON (Name and Telephone Number)
16. REPORT	17. ABSTRACT	18. THIS PAGE			
Unclassified	Unclassified	Unclassified	Unlimited	69	Dr. Elizabeth Brady 703/617-0326

Study Report 2002-06

The Multi-Skilled Soldier Concept: Considerations for Army Implementation

John T. Nelsen II
Booz Allen Hamilton

Allan Akman
Akman Associates, Inc.

Occupational Analysis Office

Darrell Worstine, Chief

U.S. Army Research Institute for the Behavioral and Social Sciences
5001 Eisenhower Avenue, Alexandria, Virginia 22333-5600

April 2002

Army Project Number
20665803D730

Personnel Performance and
Training Technology

Approved for public release; distribution is unlimited

FOREWORD

The mission of ARI is to maximize individual and unit performance and readiness to meet the full range of worldwide Army missions through advances in the behavioral and social sciences. ARI is the Army's primary laboratory conducting research and analysis on personnel performance, leader development, and training. Our focus is on the human element in the Army. Our research and analysis contributes to the entire life cycle of recruiting, selection, assignment, training, and mission performance. ARI also conducts studies and analyses to address short-term issues and respond to emerging "hot topics" and provides technical assistance on critical issues affecting all parts of the Army.

In the spring of 2001, the Personnel Proponency Directorate, Deputy Chief of Staff, Training, U.S. Army Training and Doctrine Command (TRADOC), Ft. Monroe, Virginia, asked ARI to analyze the emerging Multi-Skilled Soldier (MSS) Concept, the implementation of which was increasingly characterized by the Army leadership as a key enabler for the Objective Force. The MSS Concept had thus become one of those emerging topics in the human realm that demanded immediate attention and investigation. Specifically, we were asked to analyze the meaning and implications of the MSS Concept and to assess the considerations for Army-wide implementation. In response, we developed a Blueprint to assess potential courses of action; a Roadmap to identify generically the major actions required by the Army Leadership, the Personnel Community, and the Training Community to implement any course of action; and a Study Plan to outline those research and analysis projects, inclusive of behavioral research, that would assist most significantly in MSS personnel and training design.

Completed under contract to Booz Allen Hamilton and Akman Associates, Inc., this report was prepared under the direction of ARI's Occupational Analysis Office. The report was envisioned as the initial phase of a multi-phase effort to assess the MSS Concept relative to the Objective Force and the future operational needs of the Army. The report thus lays a solid foundation for further research and development into organizational designs, supporting personnel and training systems, best practices, and course of action development for implementing and sustaining the MSS Concept in an effective and efficient manner.

This report has been briefed to the Army's Objective Force Task Force, the Army Development System XXI Implementation Workshop, and the Personnel Proponency Directorate, Office of the Deputy Chief of Staff, Training, TRADOC.

Zita M. Simutis

ZITA M. SIMUTIS
Acting Director

ACKNOWLEDGMENTS

The authors deeply appreciate of the support and assistance they received at every stage of this project. In particular, they would like to thank the following for contributing invaluable and timely information through briefings, interviews, document reviews, or other feedback mechanisms: Colonel Dave Cutler, Colonel Reuben Jones, Sergeant Major (SGM) Gary Dahl, and SGM Edmund P. Crivello, Jr. of the U.S. Army Development System (ADS)-XXI Task Force; Colonel Gary Petrole of the U.S. Army Objective Force Task Force, Arlington, Virginia; Mr. Robert Seger, Mr. William Briscoe, Mr. D.E. MacAllister, Ms. Diana Tierney, and SGM Daniel Hubbard of the Office of the Deputy Chief of Staff, Training, TRADOC, Ft. Monroe, Virginia; Mr. Bill Shugrue, Office of the Deputy Chief of Staff, Doctrine, TRADOC, Ft. Monroe, Virginia; Colonel William M. Long, G-7 (Transformation), I Corps, Ft. Lewis, Washington; Lieutenant Colonel John Zoccola, TRADOC Brigade Coordination Cell, Ft. Lewis, Washington; Mr. Bob Statz, Mr. Jim Hitchcock, Mr. Steve Starner, and Ms. Barbara Davenport at Booz Allen Hamilton, McLean Virginia; Mr. Roger Hansen at Booz Allen Hamilton, Ft. Lewis, Washington; and Mr. Darrell Worstein, Dr. Frank Moses, Dr. Mike Rumsey, Dr. Trueman Tremble, and Dr. Zita Simutis of the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI), Alexandria, Virginia.

The authors also wish to recognize Dr. Kathy Quinkert from ARI's Scientific Coordination Office at TRADOC Headquarters for her particularly salient contributions. She facilitated timely, multi-faceted interactions with the TRADOC staff and provided invaluable updates, insights, suggestions, and leads from both the TRADOC and ARI perspectives.

We are especially grateful to Lieutenant Colonel Walter Parker, Chief Warrant Officer Five Debrah Henson, Mr. Orlando Jones, Mr. Ben Ellis, Mr. Jeff Colimon, and rest of the staff of the Personnel Proponency Directorate, Office of the Deputy Chief of Staff, TRADOC, Ft. Monroe, Virginia. LTC Parker and his office sponsored this study for ARI, hosted several in-progress reviews, orchestrated superb, broad-based feedback throughout the project, and arranged for a concluding project brief to be presented at the ADS-XXI Implementation Workshop in January 2002, the attendees at which included branch proponent representatives from across the Army.

Finally, the authors wish to express their profound gratitude to Dr. Elizabeth Brady of ARI, who directed and facilitated this study in a most admirable and collegial fashion. Her guidance, support, assistance, cooperation, and insights helped enormously to advance this study in an impressively smooth, reasonable, rigorous, and deliberate manner.

THE MULTI-SKILLED SOLDIER CONCEPT:
CONSIDERATIONS FOR ARMY IMPLEMENTATION

EXECUTIVE SUMMARY

Research Requirement:

The Multi-Skilled Soldier (MSS) Concept has been increasingly characterized by senior Army leaders as a key human-dimension enabler in the construct of the Army's Objective Force. Specifically, multi-skilled soldiers are envisioned to provide increased overall skill depth and redundancy to Objective Force units in a fashion that allows both increased combined-arms capabilities within comparatively smaller units and enhanced unit resiliency in the event of casualties. However, there is currently no consensus within the Army on an exact definition of this concept, how it might be implemented, or the implications involved. Therefore, the Personnel Proponency Office under the Deputy Chief of Staff, Training, U.S. Army Training and Doctrine Command, Ft. Monroe, Virginia, requested the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) to conduct this study as the first phase of an extended assessment and analysis of the MSS Concept. This purpose of this initial effort was to analyze the meaning and implications of this concept and to assess the considerations for Army-wide implementation in order to provide the basis for the Army to make decisions whether or not to proceed with realization of the MSS Concept and, if so, how.

Procedure:

The objectives of this study were to analyze the MSS Concept and its implications generally for the Army and specifically for the Objective Force, to develop a Blueprint for use in defining and assessing potential MSS implementation and sustainment courses of action, to devise a Roadmap outlining major actions required for MSS implementation by 2008, to craft a Study Plan of research and analysis projects necessary to support MSS implementation and sustainment, and to make associated conclusions and recommendations. This study relied heavily on non-attribution interviews conducted from August 2001 through January 2002 with those involved in developing the concepts for the Objective Force and in fielding the initial Interim Brigade Combat Teams (IBCTs). The target audience for this report is the Army Leadership in general, and the leaders of the Army's Personnel and Training Communities in particular.

Findings:

The MSS Concept can have quite different meanings for different people. Definitions often vary considerably, according to how one combines and prioritizes the notions generally associated with it: the additionally skilled soldier, the generic MOS soldier, the adaptable soldier, and the perpetually learning soldier. There is no official consensus definition of the MSS relative to the requirements of the Objective Force, and no integrated planning underway for comprehensive implementation. Yet, such implementation, if pursued, would be one of the longer poles in the tent in standing up the Objective Force and would require complex planning and other preparatory efforts on the part of the Army Leadership, the Personnel Community, and the Training Community. In addition, virtually all discussion about the MSS has understandably revolved around the needs of the Objective Force. However, there is much merit to exploring a broader application across the entire force. The report makes the following recommendations:

- The Army should expeditiously and authoritatively define the MSS Concept.
- The Army should expeditiously establish overall proponency for MSS realization, select a corresponding course of action from among several candidates, and put an integrated master implementation plan in place.
- The Army should structure MSS implementation and sustainment for optimal and parallel benefit of the Interim and Legacy Forces.
- The Army should conduct the necessary supporting research and analysis projects to implement the MSS Concept effectively and efficiently.

Utilization of Findings:

Since MSS implementation requires long lead times, the Army must move out swiftly to have it in place for the first Objective Force units. If the Army decides to pursue this implementation, the Blueprint, Roadmap, and Study Plan developed in this report will prove very useful in guiding and focusing those efforts. Borrowing from those documents and from the report's recommendations, the immediate way ahead to MSS implementation involves developing an authoritative Army definition of the MSS Concept, designating an overall proponent, developing implementation and sustainment courses of action for decision, crafting a master plan to drive execution, earmarking the necessary resources, initiating the research and analysis projects most central to effective and effective personnel and training re-designs, developing unit prototypes, building required skill databases, continuing with synchronized MOS consolidations, and tailoring the MOSC process for the MSS. The discussion of the MSS Concept, as well as the MSS Blueprint, Roadmap, and Study Plan, contained in this report, provide a generic, phased approach for expediting the start of MSS implementation planning in the near term, regardless of the exact MSS definition that might be adopted at a later point.

THE MULTI-SKILLED SOLDIER CONCEPT:
CONSIDERATIONS FOR ARMY IMPLEMENTATION

CONTENTS

Page

INTRODUCTION…….1

Purpose…….1
Overview……..2
Methodology……....2

THE MULTI-SKILLED SOLDIER CONCEPT……...3

Traditional Army Approaches to Multi-Skilling…….…...3
The Emerging Concept of the Multi-Skilled Soldier….……4
The Multi-Skilled Soldier and the Objective Force…….……7
Basic Terms……...8
This Study's Characterization of the Multi-Skilled Soldier……...9
Implementation Imperatives……....11
Potential Impacts on the Training Paradigm…….12

THE MULTI-SKILLED SOLDIER DEVELOPMENTAL BLUEPRINT.……14

Force Design Component……...…..15
MOS Design Component……..16
Training design Component……...…….18
Implementation Component……....20
Sustainment Component……...…...22
Tradeoffs and Constraints……24

THE MULTI-SKILLED SOLDIER ROADMAP……...24

Approach…….25
Army Leadership……...27
Personnel Community……..29
Training Community…….31

CONTENTS (Continued)

THE MULTI-SKILLED SOLDIER STUDY PLAN……..34

Approach……34
Immediate and Near-Term Research and Analysis Projects (2002-04)……..…37
Mid-Term Research and Analysis Projects (2004-06)…..……37
Long-Term Research and Analysis Projects (2006-08)…...…..……...…37

CONCLUSIONS AND RECOMMENDATIONS……...39

Conclusions……...39
Recommendations….……...40
The Immediate Way Ahead……41

REFERENCES……..44

APPENDIX A – List of Abbreviations and Acronyms……A-1

APPENDIX B - Proposed Research and Analysis Project Descriptions..……..…B-1

LIST OF TABLES

Table 1 MSS Roadmap (Army Leadership)…….……...28
Table 2 MSS Roadmap (Personnel Community) ……..30
Table 3 MSS Roadmap (Training Community)……..32
Table 4 Immediate and Near-term Research and Analysis Projects……...36
Table 5 Mid-term and Long-term Research and Analysis Projects..……...38
Table 6 Conclusions and Recommendations……..41
Table 7 Compelling Immediate Actions…….….43

LIST OF FIGURES

Figure 1 Strawman Training Paradigm ……..13
Figure 2 MSS Developmental Blueprint……..15
Figure 3 Force Design Component……...16
Figure 4 MOS Design Component……17
Figure 5 Training Design Component ……19
Figure 6 Implementation Component……..20
Figure 7 Sustainment Component ……...23
Figure 8 The MSS Roadmap Overview……....26
Figure 9 Approach for Determining Studies…….……..35

THE MULTI-SKILLED SOLDIER CONCEPT: CONSIDERATIONS FOR ARMY IMPLEMENTATION

INTRODUCTION

The U.S. Army's ongoing transformation process involves the fielding of a number of highly deployable Interim Brigade Combat Teams (IBCTs). These units will serve alongside of so-called Legacy Force units (that is, traditionally organized and equipped units from the Cold War and immediate post-Cold War era), en route to the eventual reshaping of mainstream Army units into the Objective Force (OF). The first OF units are currently envisioned to start appearing in the Army's force structure in 2008. However, what we today term Legacy and Interim Force units will likely serve alongside of the new OF units until well beyond 2010. Many fully expect the Army's future force structure to reflect a mix of Legacy Force, Interim Force, and OF units until at least 2020.

The Multi-Skilled Soldier (MSS) Concept has been repeatedly characterized by senior Army leaders as a key human-dimension enabler in the construct of the Army's OF. Specifically, multi-skilled soldiers are expected to provide increased overall skill depth and redundancy to OF units in a fashion that allows both increased organic combined-arms capabilities within comparatively smaller units and enhanced unit resiliency in the event of casualties. However, there is currently no consensus within the Army on an exact definition of this concept, how it might be implemented, or the implications involved. Therefore, in June 2001, the emerging Personnel Proponency Directorate within the Office of the Deputy Chief of Staff, Training, for the U.S. Army Training and Doctrine Command (TRADOC), Fort Monroe, Virginia, requested the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) to conduct this study as the first phase of an extended assessment and analysis of the MSS Concept.

Purpose

The purpose of this study was to analyze the meaning and implications of the MSS Concept and to assess the considerations for Army-wide implementation in order to provide a basis for the Army to make decisions whether or not to proceed with realization of the MSS Concept and, if so, how. The target audience for this report is the Army Leadership in general, and the leaders of the Army's Personnel and Training Communities in particular. It is they who ultimately must make the major decisions about the MSS Concept for the Army and who must consider and decide upon the conclusions and recommendations of this report.

Overview

First, this study provides background and discusses issues surrounding the MSS Concept currently under consideration by the U.S. Army. It explores the various perceptions of the MSS, the stated needs of the OF, implementation imperatives, notional definitions of the MSS, and associated personnel and training implications.

Second, it describes an MSS Developmental Blueprint, which frames a process that can be used to define the salient issues and factors the Army will have to address in formulating and assessing options, or courses of action, for implementing and sustaining an MSS Concept. This Blueprint is designed to assist in articulating the requirements for future soldier competencies, as well as a process for assessing options designed to produce considerably different skill sets for soldiers serving in maneuver, maneuver support, and maneuver sustainment units. In short, this process will provide a framework for a comprehensive, multi-dimensional analysis of the implications connected with whatever implementation and sustainment courses of action may be considered.

Third, an MSS Roadmap and an MSS Study Plan are presented. The Roadmap is intended to outline the major actions required by the Army to examine, adopt, and implement an appropriate MSS Concept by 2008 and to sustain it thereafter. The companion Study Plan identifies those research and analysis questions and issues, inclusive of behavioral studies, deemed necessary to support an efficiently executed MSS implementation and sustainment master plan.

The Blueprint, Roadmap, and Study Plan have been crafted in generic terms so that they can be easily applied across a broad spectrum of possible MSS definitions to assist significantly in advancing MSS implementation and sustainment planning. In other words, they outline the factors, actions, activities, projects, decisions, assessments, and other considerations common to actualizing any MSS conceptual definition that the Army might authoritatively adopt from among the possible permutations suggested by this report.

Methodology

This study relies heavily on non-attribution briefings from, and interviews with, those involved in developing the concepts for the OF and in fielding the Army's initial IBCTs. Those individuals had frequent contact with senior Army leaders and were intimately familiar with close-hold OF and IBCT requirements documents, as well as related, dynamically emerging operational and organizational thinking. These interviews and briefings took place from August 2001 through January 2002.
In most cases, the documents and briefings were still in draft form and thus not yet releasable to the public or to the authors. Particular attention was paid to the work and conceptual thinking of the Army Development System XXI Task Force (ADS-XXI TF), the Objective Force Task Force (OFTF), those U.S. Army Training and Doctrine

Command (TRADOC) Staff Directorates most engaged with the OF, and those at Ft. Lewis, Washington, working to field the first IBCTs.

THE MULTI-SKILLED SOLDIER CONCEPT

The MSS Concept is still clearly embryonic. Throughout the Army different organizations and individuals have disparate views of it. In general, most variations involve emphasizing or highlighting different aspects, sometimes to the exclusion of others. At first blush, these differences often appear relatively minor. However, the nuances tend to influence thinking in quite different directions regarding future concept development and implementation. In fact, whenever one is discussing the MSS Concept, it is prudent first to ask those involved to explain their understanding of the concept. Failing to do so often leads to miscommunication.

Understanding these different conceptual constructs is therefore important in developing a consensus definition of the MSS that can serve as a common departure point for possible implementation. Otherwise, the focus of this and future efforts might flounder on an inconsistent and confusing mixture of ideas. This section summarizes the various views that have emerged and concludes with an initial characterization of an MSS Concept that is grounded in a set of terms and definitions. This characterization of the MSS Concept will then serve as the basis for the MSS Developmental Blueprint, the MSS Roadmap, and the MSS Study Plan, as well as for further concept refinement and definition.

Traditional Army Approaches to Multi-Skilling

The notion of developing soldiers with increasingly broader sets of basic skills is not new to the U.S. Army. Unit commanders have frequently attempted to cross-train their soldiers so that they could expertly handle all the weapons in their platoons, not just their individually assigned weapon. In combat, for example, if an assigned machine gunner became a casualty, another soldier whose assigned weapon is a rifle/grenade launcher could step forward and immediately operate the machinegun proficiently.

Unit commanders also have habitually resorted to assigning soldiers to positions requiring largely different sets of skills than those of their basic Military Occupational Specialty (MOS). In these cases, the soldiers generally learn their new skills through on-the-job training (OJT), whether formally or informally, and are frequently awarded a secondary MOS upon demonstrating proficiency in the new job. This is usually done principally for the needs of the unit, particularly when shortages in critically needed MOS occur. For example, an 11B (Infantryman) in a battalion may be assigned to the mortar platoon as a mortar crewman (MOS 11C, Indirect Fire Infantryman) when there are prolonged shortages of 11Cs and an abundance of 11Bs assigned. Similarly, an M-1 Armor Crewman (MOS 19K) could be assigned to a position of Unit Supply Specialist

(MOS 92Y) in his company if that critical position became vacant and if the 92Y replacement flow were problematically slow.

Broadening soldier skills has manifested itself in other ways. Frequently units strive to train their soldiers to perform tasks within their MOS at one or more higher skill levels. For instance, soldiers in a mortar platoon at Skill Level (SL) 1 (MOS 11C10) could be trained to perform tasks at SL 2 and 3 (MOS 11C20 and 11C30) in anticipation of promotion and to provide greater skill depth and redundancy in the unit. In this case, if a 11C30 became incapacitated during training or combat, a 11C20 in his squad could step up immediately to perform 11C30 duties competently while an 11C10 could simultaneously backfill him and perform 11C20 duties adequately.

Another category of cross training involves teaching soldiers to perform carefully chosen sub-sets of tasks belonging to an entirely different MOS. For example, many units are generally required to train and certify a minimum number of their soldiers as combat lifesavers. These soldiers are trained in advanced combat lifesaving, first-aid tasks that, in essence, would encompass many but not all of the apprentice skills required of a formally trained Health Care Specialist (MOS 91W) [formerly known as medics] assigned to the battalion's medical platoon. Since the Health Care Specialist is a low-density MOS in a maneuver unit, he may not be quickly at the side of wounded or injured soldiers. Having a large number of combat lifesavers in the unit means that seriously hurt soldiers would more likely receive immediate and competent lifesaving care, even if Health Care Specialists could not reach them promptly.

Another traditional Army approach for developing multi-skilled soldiers involves awarding a secondary MOS to soldiers, usually at the Non-Commissioned Officer (NCO) level. For example, an NCO who was initially an Infantryman (11B40) could acquire a secondary MOS (SMOS) from a long list of possibilities, such as Military Policeman (95B40), Imagery Analyst (MOS 96D40), Recruiter (MOS 79R40), or Career Counselor (MOS 79S40), just to name a few.

The Emerging Concept of the Multi-Skilled Soldier

Today's MSS Concept, which is still evolving, encompasses several notions that differ considerably from much of the Army's previous approaches to broadening soldier skills. The feature of the MSS Concept that most differentiates it from previous efforts is that focuses on soldiers during their initial training experience. Previously, efforts at multi-skilling have occurred after initial entry training, and have typically focused on soldiers who have already become, or are about to become, NCOs

Different organizations tend to group and emphasize the following main notions about the MSS in quite different ways, with the effect of creating a distinct spectrum of definitional blends, end-state expectations, and institutional implications. Based on the interviews conducted, the following notions are the more pronounced and noteworthy:

1. **The Additionally Skilled Soldier**. One approach would focus principally on training the soldier differently during his initial training base experience [the equivalent of today's Basic Combat Training (BCT) and Advanced Individual Training (AIT)]. As a consequence, he would report to his initial unit of assignment cross-trained in a carefully crafted blend of tasks considerably different from those traditionally associated with his primary MOS. In most cases, this would involve skill sets drawn from MOS that are, in effect, low density within his assigned unit and combined-arms in nature since such tasks have been generally associated with different branch proponents in the past. For example, a soldier trained principally as an Infantryman (11B) in a maneuver unit might be cross-trained in a variety of selected sub-tasks that are today associated with one or more of the following MOS (at SL 1 or 2): Light Vehicle Repairman (MOS 63B), Bradley Fighting Vehicle System Mechanic (MOS 63T), Health Care Specialist (MOS 91W), Unit Supply Specialist (MOS 92Y), Petroleum Supply Specialist (MOS 77F), and Motor Transport Operator (MOS 88M), among others. While these MOS are may not be termed low-density across the Army, they are generally regarded as low-density in maneuver and maneuver support units. Different soldiers would be cross-trained in different sub-sets of tasks in a modular fashion. The principal responsibility for this cross training would reside with the Institutional Army, and not with the soldier's first unit of assignment. This MSS approach would be linked directly to the operational requirements of the future OF. In part, this means that the blending of skills a soldier acquires from the training base would be driven by the requirement to provide greater depth and redundancy of specific skills sets within the OF's smallest self-sufficient unit, the Unit of Action. The Legacy Force and the IBCTs could benefit as well from soldiers who receive such training.

2. **The Generic Soldier.** This approach largely focuses on the desired results from continuing MOS consolidations. Soldiers would become more MOS generic. They would reflect a selective consolidation of major MOS along the lines recently implemented for the infantry MOS to form a single generic infantry MOS, the 11B (reflecting the consolidation of the 11B traditional Infantryman, the 11M Fighting Vehicle Infantryman, and the 11H Heavy Anti-Armor Weapons Infantryman). Using this methodology, the same kind of consolidation might be applied to create other, more generic MOS, significantly reducing the number of MOS. As an example, one might consider establishing a generic artilleryman, entitled the Indirect Fire Crewman. This crewman would be trained on the principles of operating indirect fire weapons, including the commonly identifiable tasks and responsibilities of the crewmembers in servicing such systems, whether for a mortar, a towed artillery piece, a self-propelled howitzer, or a Multiple Launch Rocket System (MLRS). Such generic tasks would include laying in the guns, entering firing data on the guns or rocket system, cutting charges, setting fuses, reacting to malfunctions, adhering to basic safety procedures, adjusting fires, occupying a position, displacing, and the like. In addition, the Indirect Fire Crewman would be trained on representative indirect

firing systems (possibly an 81mm Mortar and a self-propelled 155 mm Howitzer) in significant enough detail to enable him not only to operate those specific systems, but also, and just as importantly, to adapt quickly to serving as a crewman on similar but different indirect fire systems in the U.S. Army inventory, whether in a Legacy, Interim, or OF unit. Once he understands the overarching principles, the soldier would be better suited and prepared to adapt rapidly to whatever indirect fire weapon with which his subsequent units of assignment may be equipped.

3. **The Adaptable Soldier**. Another approach frequently associated with the emerging MSS Concept focuses chiefly on developing soldiers with significantly enhanced capacities for adaptability, versatility, and mental flexibility. According to this notion, tomorrow's multi-skilled soldiers are expected to exhibit many of the creative and problem-solving qualities attributed to the emerging notion of the adaptive leader. In fact, many prefer the characterization of the adaptable soldier to that of the multi-skilled soldier. The focus of the training would be to instill in the soldier the mindset of adaptability, self-education, and problem solving as defining attributes. The notion here is that a soldier's training provides not only skill sets to perform tasks effectively in given contexts, but the necessary attributes and orientation to adaptively and creatively apply existing knowledges and skills to deal successfully with new tasks in distinctly different situations. For many, this approach is termed competency-based, implying the ability to get things done, whatever they are, by adaptively employing existing inventories of knowledges, abilities, attitudes, and skills. Many argue that the most fundamental defining characteristic of the future multi-skilled soldiers should be the competency-based training they receive and subsequently apply as an ingrained approach to mission accomplishment. This competency-based approach is often juxtaposed to the Army's traditional task-based approach to training. By extension, this adaptive mindset would help steel soldiers psychologically in transitioning rapidly from one kind of mission to another along the range of military operations, thereby better contributing to forging more resilient multi-functional units.

4. **The Perpetually Learning Soldier**. This approach is increasingly referred to as that of life-long learning. It is fully compatible and complementary with the aforementioned notions of the additionally skilled soldier, the generic soldier, and the adaptable soldier. Perpetually learning soldiers must be educated, trained, and motivated to deepen and broaden the skills they acquire in their initial entry training and thereafter through never ending self-education, largely featuring distributed training (DT) and distance learning (DL). This notion suggests that significant professional development incentives, both positive and negative, must be used to reward soldiers who seriously pursue self-learning throughout their careers and to penalize those who do not. Additionally it assumes that soldiers will have the necessary learning resources and mentoring consistently available to help focus and sustain self-education. It also assumes

that soldiers will have the time and energy to pursue self-study beyond the daily demands of job performance. Life-long learning is regarded by many as a silver bullet that can reduce risk in an aggressive approach to MOS consolidation. The central unresolved issue with this notion is how much one can reasonably expect from the average soldier regarding self-education, as well as the practical availability of resources required to establish and maintain such a truly comprehensive program.

The Multi-Skilled Soldier and the Objective Force

In the future, it is envisioned that our military units will have to be able to transition more swiftly than ever before from one kind of mission to another (e.g., from a combat mission, to a humanitarian assistance mission, to a peacekeeping mission, and back to a combat mission.), both physically and mentally. The OF is being developed with this squarely in mind. The intent is to field a force that is so self-reliant, flexible, and adaptable that it can rapidly transition from one kind of operation to another with minimal internal disruption or reconfiguration, deploy with unprecedented speed, and quickly dominate any situation.

The fundamental unit building block is currently termed the Unit of Action. This will be a self-sufficient, combined-arms force with organic maneuver, maneuver support, and maneuver sustainment capabilities. It must be capable of operating on an increasingly dispersed and non-linear battlefield. For this reason, its soldiers must possess an aggregate depth and redundancy in skills never before achieved in Army units of comparable size. The Unit of Action must be capable of accepting moderate losses, especially in its low density MOS, without significantly degrading its capability to execute any of its basic combined-arms functions. At the same time, the size of this unit cannot swell to equal the size of an equivalent Legacy Force unit, which would require extensive attachments to give it the same redundancy and depth in combined arms capabilities. To remain rapidly strategically deployable and tactically mobile, the Unit of Action must remain as small as possible, consistent with the broad capabilities it must have. The multi-skilled, adaptive soldier is thus a key enabler for the Unit of Action to operate resiliently and enduringly as an inherently self-sufficient, agile, combined arms force over comparatively extended distances.

As OF units enter the force, they will be serving alongside of Legacy and Interim Force units for many years to come, posing an increasingly complex challenge for the training base and the individual soldier. This challenge will be heightened by the growing use of Commercial Off-the-Shelf (COTS) technology to upgrade unit technological capabilities swiftly. Training soldiers to operate specific pieces of equipment, whether they are artillery howitzers or signal equipment, will be more and more problematic. The Army will likely have a growing number of types of equipment, many experimental, for different kinds of units. Therefore, training soldiers during their initial entry training in a way to facilitate adapting to the specific equipment items in their follow-on units of assignment makes a great deal of sense. This requires a

different training approach. Rather than training to operate a piece of equipment according to a memorized, step-by-step rote methodology, soldiers could be taught more about principles of operation and associated problem-solving skills, along with how to use appropriate operator's manuals and other key reference materials adroitly. In this way, soldiers completing initial entry training would be better prepared to master quickly whatever major equipment items were prevalent in their follow-on units of assignment. Thus, the MSS Concept, in the minds of many, has enormous utility in this diverse organizational environment, with its growing equipment permutations.

Basic Terms

Much of the difficulty in gaining a consensus on a definition of the MSS revolves around the language used. In many instances, terms and ideas that are quite distinct from one another are used interchangeably. This leads to MSS Concepts that sometimes differ simply because of language and, at other times, appear similar but are substantially different. Among the terms that most often come into play when MSS Concepts are being discussed are MOS, tasks, and skills and, to a lesser extent, knowledges and abilities.

MOS has been the way jobs have been identified and described in the Army. In the MSS environment, the MOS would continue to represent the totality of a single job performed by a soldier. The job could be described in terms of a number of different factors. The Army has traditionally defined jobs as comprising a given set of tasks.

A task is a clearly defined and measurable activity accomplished by an individual soldier (TRADOC, 1999). Tasks can be grouped and categorized in various ways. For example, common tasks are those performed by all soldiers regardless of their MOS. Branch-common tasks are those required of all soldiers whose MOS are associated with a given branch (e.g., infantry, artillery, armor, transportation, and the like). And MOS-specific tasks are those unique to a particular MOS.

Associated with a task are knowledges, skills, and abilities (KSA), which are enablers in that they facilitate task performance. Knowledges can be learned. Skills can be trained. Abilities, because they are inherent to a person, are acquired by the Army through selection and recruiting.

A knowledge consists of organized sets of principles and facts required to perform a task (Employment and Training Administration, 1999). A task may require more than a single knowledge, and a single knowledge may be required for a number of tasks. Knowledge has been used by the Army to assess the commonality among MOS and could continue to be used as a discriminator in determining the feasibility of restructuring MOS. However, MSS notions are not commonly described in terms of knowledges.

Ability, like knowledge, is not often used in the context of describing the multi-skilled soldier. Ability is an enduring attribute of an individual that influences task performance. Abilities are regarded as traits in that they exhibit some degree of stability over relatively long periods of time. Examples include oral comprehension, written expression, memorization, manual dexterity, vision, and hearing sensitivity, among others.

The term skill is central to any discussion of the MSS Concept. A skill is a developed capacity to perform tasks, predicated in part on the individual's possession of relevant underlying knowledge and abilities. Examples of skills include reading comprehension, writing, critical thinking, problem identification, troubleshooting, judgment and decision making, and time management.

The notion of competency is increasingly used in reference to the MSS Concept. The ADS-XXI TF defined competency as the ability to perform in a given context and the capacity to transfer knowledge and skills to new tasks and situations. Attributes such as knowledges, skills, abilities, and attitudes, in combination, underlie competence.

This Study's Characterization of the Multi-Skilled Soldier

The Army's pursuit of a more multi-skilled soldier derives most directly from thinking about soldier requirements for the Unit of Action, the fundamental, stand-alone unit building block of the OF. A Unit of Action will have a much smaller organizational footprint than today's units of comparable capability. The belief is that this can be accomplished, in part, by developing more adaptive soldiers—soldiers who can competently perform additional tasks beyond those traditionally defined by their MOS. The goal is to increase task commonality with respect to various MOS subsets so that more soldiers can perform more tasks, thereby providing much more skill depth and redundancy, especially for low-density, high-impact MOS. This would apply, for example, to infantry soldiers able to perform as super combat lifesavers or fuel handlers, when such specialists are incapacitated, otherwise unavailable, or overwhelmed temporarily by a workload surge.

The real impetus for the multi-skilled soldier is to have a soldier who is exceptionally adaptable and can adequately perform a greater variety of tasks on the battlefield. While having soldiers with more skills will facilitate that, the soldier may also need to have more abilities and more knowledges. So, although the focus here is on the multi-skilled soldier, the other enablers also must be accounted for in the design of the future soldier. The key is establishing the requirements for what soldiers must be able to do in future Units of Action. Defining those requirements will, in turn, lead to an identification of the mix of knowledges, skills, and abilities that the soldier must have. Knowing the KSA requirements sets the stage for defining selection and recruiting, teaching, and training.

Understanding tasks and KSA helps explain the various depictions of the MSS. Depending upon the formulation, the soldier being described may have more skills, knowledges, and abilities than presently. Certainly, a fundamental assertion of the MSS Concept is that more KSA will enable soldiers to perform a greater variety of tasks. So, while various examples may involve soldiers with more abilities, more knowledges, or more skills than is currently the case, ultimately the goal is to have soldiers who can perform more tasks. In essence, the multi-skilled soldier, if the Army's soldier goals are to be achieved, is a multi-KSA soldier. This study thus characterizes the MSS Concept as follows:

1. First and foremost, the multi-skilled soldier is one who may be recruited from a pool having a different ability set than current recruits and who emerges from the initial institutional training experience (tomorrow's equivalent of BCT and AIT) better trained in the base MOS knowledges and skills required for his first troop assignment than today's soldier. The training would be more generic, as discussed above, resulting from a degree of consolidation of today's MOS structure.

2. The generic training the soldier receives for his base MOS would emphasize a competency-based training approach wherever possible. The soldier would train on representative equipment systems, with a primary emphasis on how to adapt rapidly to similar but different systems throughout his functional area. The intent is to produce a more thinking soldier, partially by employing different selection criteria and partially by implementing a mainstream training approach which is much less rote-based and much more competency-based or comprehension-based. Much of this training would cover overarching principles with the intent of instilling in the soldier a broader understanding of the dynamics of equipment operations, techniques, and procedures. It would also focus specifically on how to apply these skill sets in diverse situations. This would enable the soldier to apply his skills adaptively and creatively to equipment and situations beyond just the ones to which he has been specifically exposed in previous training experiences. Thus, the soldier's training would be focused on how to expand his skill and knowledge sets, both adaptively in new challenging job situations and also through parallel self-study, along functional lines to meet unit needs. Armed with this considerably broadened understanding, the soldier would be better equipped, psychologically and otherwise, for the kind of problem solving and aggressive, perpetual self-learning associated with increased skill set adaptability for dynamic situations. Key would be teaching the soldier how to pursue self-training to deepen, broaden, and sustain all his skills once he completes initial entry training.

3. At the same time, the soldier would be trained on additional skills and taught additional knowledges which fall outside the scope of today's base MOS. The soldier would receive carefully selected subsets of apprentice-level skills and knowledges associated with other MOS, most of which are associated with other

branches in today's frame of reference. The main purpose is to provide increased combined-arms skill depth and redundancy, particularly for low-density MOS, in Table of Organization and Equipment (TOE) units. The principal driving force for the groupings of these skill sets would be the operational needs of the OF's Unit of Action. However, the MOS design would also promise to enhance combined-arms skill depth and redundancy for Interim and Legacy Force units as well.

4. Once he joins his first TOE unit, the multi-skilled soldier would be expected to sustain and deepen his skills and knowledges, relative to both his base MOS and the additional sets of skills and knowlegdes received from initial entry training. Much of the effort to do so would fall on the shoulders of the individual soldier, who would be expected to pursue skill and knowledge growth both through unit training experiences and energetic self-study, validating success via tests and other certifications. Career development incentives would reward soldiers who do so and penalize those who do not.

Implementation Imperatives

Many senior Army leaders see great promise in pursuing the MSS Concept. However, based on a number of interviews, the following imperatives appear under serious consideration as parameters for devising implementation approaches.

1. The Concept should be implemented in a way that does not lengthen the amount of time a new soldier spends in his initial entry training (the equivalent of today's BCT and AIT) before joining his first regular unit. This is usually expressed in terms of keeping the Trainees, Transients, Holdees, and Students (TTHS) account from increasing.

2. The Concept should be implemented in a fashion that does **NOT** transfer an increased burden to field commanders for individual training. The philosophy that the Institutional Army trains individual soldiers, while field commanders train their units must be upheld. It is broadly recognized that conceptually there is a limit to the amount of individual enhancement training unit commanders can assume without having a major adverse effect on the aggregate quality of collective training and, hence, on unit readiness.

3. The MSS Concept is different from the current system by which enlisted soldiers or NCOs acquire a secondary MOS. The MSS Concept relates primarily to the training soldiers receive before joining their first regular units, as well as during their initial assignment there (i.e., before they are promoted to NCO rank).

4. Implementation of this Concept should involve a heavy emphasis on DL and DT to broaden and sustain designated skill subsets. The implication here is that soldiers must be educated how to train themselves once they depart initial entry

training and join their first field units, as well as motivated to take personal responsibility and initiative for such learning. In the process, they must be thoroughly acquainted with accessing and employing the DL tools at their disposal. Soldiers must be professionally rewarded for following through with such DL training, and penalized for not doing so.

Potential Impacts on the Training Paradigm

One of the areas most affected by the implementation of the MSS Concept will be the training base, particularly that part of the Institutional Army responsible for conducting initial entry training and all subsequent schoolhouse training. In the future, the Institutional Army's role in distributed training will become increasingly pivotal for sustaining and broadening soldier skills after initial entry training. Of course, there are many options for the potential implementation of the MSS Concept in the Army. For example, the concept could be implemented only for OF units. Or the concept could be implemented for all soldiers undergoing initial entry, regardless of whether their follow-on assignments will be to OF, Interim Force, or Legacy Force units. In addition, the concept could be implemented over a short period of time in the next few years, or it could be implemented in an incremental, evolutionary fashion in phases over time. In short, different options (also termed approaches or courses of action) would have different impacts on the training base. There is no doubt, however, that any effort to implement this Concept would likely have a major impact. The only question is the degree, duration, and character of that impact.

For illustrative purposes, a new training paradigm was presented as a strawman during the study's interviews to spur discussion. This paradigm was intended as a potential training approach, or course of action, with regard to institutional re-design of training in connection with MSS Concept realization. Virtually every discussant responded favorably, finding in the new paradigm great resonance with current thinking. The elements of this paradigm are outlined in Figure 1.

The first element in the paradigm is termed Warrior Training (WT), and replaces today's BCT. However, its intent is to provide all soldiers, regardless of eventual MOS, with a common base of mentally and physically challenging infantry and other common-skill training to serve as a foundation for their entire military careers. This approach is akin to the Marine Corps' approach that every Marine is a Marine first and foremost. Warrior Training is thus intended to instill the cultural value that every soldier is first and foremost a war fighter trained in basic infantry skills. In this regard, Warrior Training could become the rite of passage for becoming a soldier. At graduation, for example, every trainee could be awarded his first black beret as an outward sign of having earned full soldier status.

The next element is titled Advanced Training (AVT) and replaces today's AIT. Like AIT, this training is focused initially on the soldier's base MOS skills. Unlike AIT, however, this training is conducted along the lines of traditional schoolhouse training.

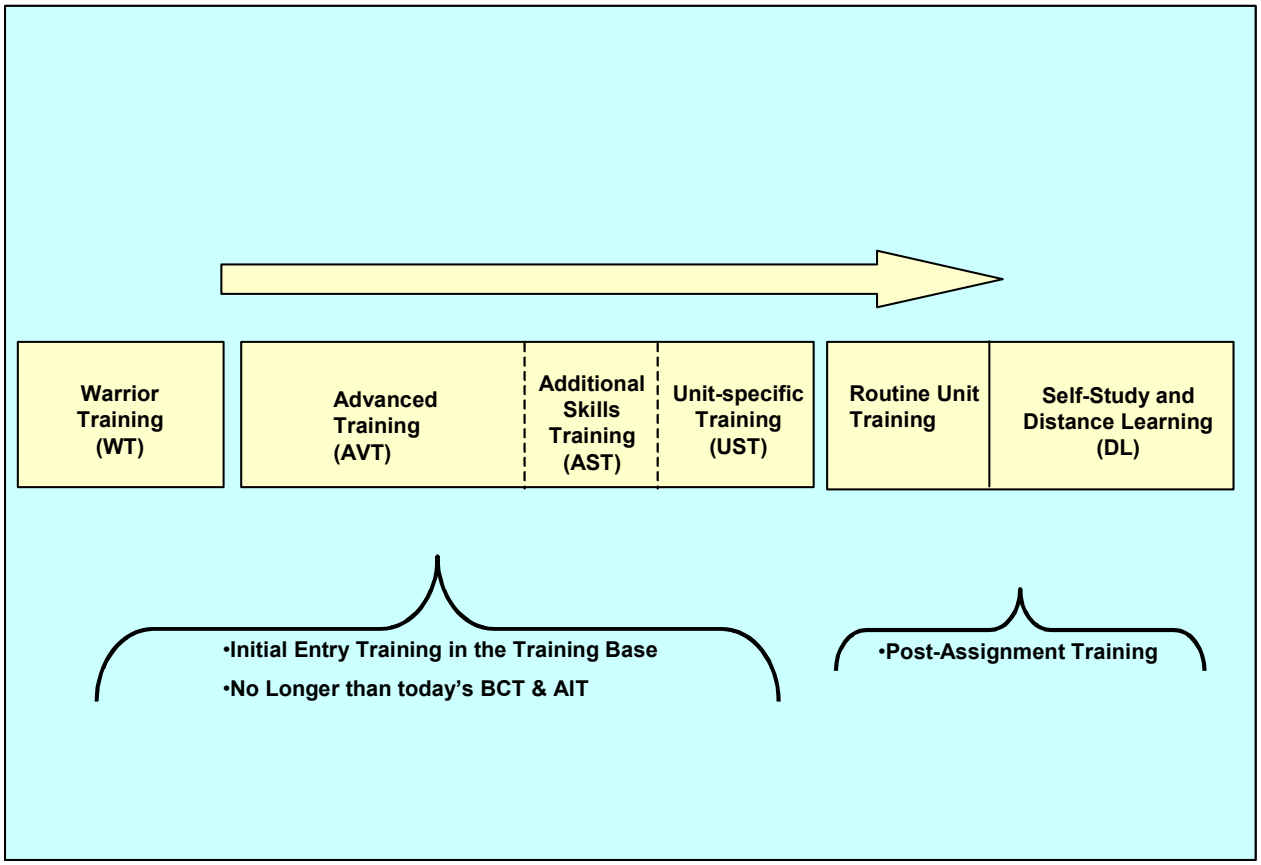

Figure 1. Strawman Training Paradigm

As one discussant termed it, this is designed to promote learning with a more professional atmosphere without doing pushups with a Drill Instructor yelling in your ear. The notion here is that the individual has already proven himself to be a soldier. He has completed his initial rite of passage. The purpose in Advanced Training is to learn as much about the MOS as possible in such a way as to produce the thinking, perpetual-learning soldier discussed previously. This does not mean that such training would be easy. Tough, challenging, purposeful field training would be conducted, as needed, to impart the necessary skills. As previously described, the soldiers would be trained more generically than today in their base MOS and would receive training on representative equipment they might encounter in their first subsequent unit of assignment. At the same time, they would be trained how to adapt to whatever specific equipment was on hand in those units. At some point in AVT, soldiers would receive modular Additional Skills Training (AST) in one or more subsets of skills associated currently with other MOS to provide the combined-arms, multi-skilled dimension to their training. Each designated module would receive a pre-designated percentage of the soldiers in each AVT class for training, based upon the predetermined needs of the Unit of Action for skill depth and redundancy.

Following AVT and AST or appended to it would be Unit-Specific Training (UST). This training is the last training a soldier would receive before reporting to his first subsequent unit of assignment and would be geared to the major equipment actually found in that unit. Consider, for example, the case of an Indirect Fire Crewman trained on representative artillery systems in AVT, say the 81mm Mortar and the 155mm Towed Howitzer, who received a follow-on assignment to an artillery unit equipped with 155mm Self-Propelled Paladin Howitzers. UST would involve a short, intensive course, perhaps lasting one or two weeks, focused on the specifics of crewing the Paladin Howitzer and designed to prepare the soldier to pass the crew certification test that his new unit will invariably administer before allowing him to participate in live fire exercises. It could be conducted at the same location as AVT; it could be conducted en route to the unit assignment following AVT; or it could be conducted at the installation where the soldier will be assigned by TRADOC teams. In any event, the soldier would report to his new unit better prepared than today to contribute to its mission accomplishment, both from the perspective of his base MOS and from the perspective of the additional skills sets acquired beyond the base MOS. This UST approach is intended to meet approximately the same requirements that TRADOC 's current program of Assignment Oriented Training (AOT) is being developed to address.

The final element of this training paradigm involves the training each soldier receives in his new unit of assignment. This would have two dimensions. First, it would involve individual and collective training conducted by the unit on a routine basis. Second, it would involve considerable individual study by the soldier to deepen and sustain the skills received in WT and AVT, including those skill sets external to the base MOS learned in the AST portion of AVT. DL would play a crucial resource role in this effort. TRADOC would have to develop standard courses and other training packages to support this approach, which would require some unit participation, especially for critical hands-on training and certifications. The soldier who progresses in this DL-centric approach would be richly rewarded in career progression, while the soldier who fails to progress would be significantly penalized. Of course, appropriate safeguards would have to be in place to prevent soldiers on extended deployments from being penalized in career progression if they are unable to meet the required DL progression gates specifically because of the circumstances of those deployments.

THE MULTI-SKILLED SOLDIER DEVELOPMENTAL BLUEPRINT

While enthusiasm for the Concept of the Multi-Skilled Soldier is clearly gaining steam, its development still remains at a relatively embryonic stage. A full implementation of the MSS Concept across the Army would be a potentially complex and costly undertaking. For that reason, a number of potential courses of action, or approaches, will likely be considered for implementation.

The purpose of the MSS Developmental Blueprint shown in Figure 2 is to assist and guide that process by suggesting the more salient considerations that should be addressed in any comprehensive implementation scheme. It is intended to provide Army personnel and training planners a process model to identify the key elements, tradeoffs, and constraints necessary to make decisions leading to multi-skilled soldiers.

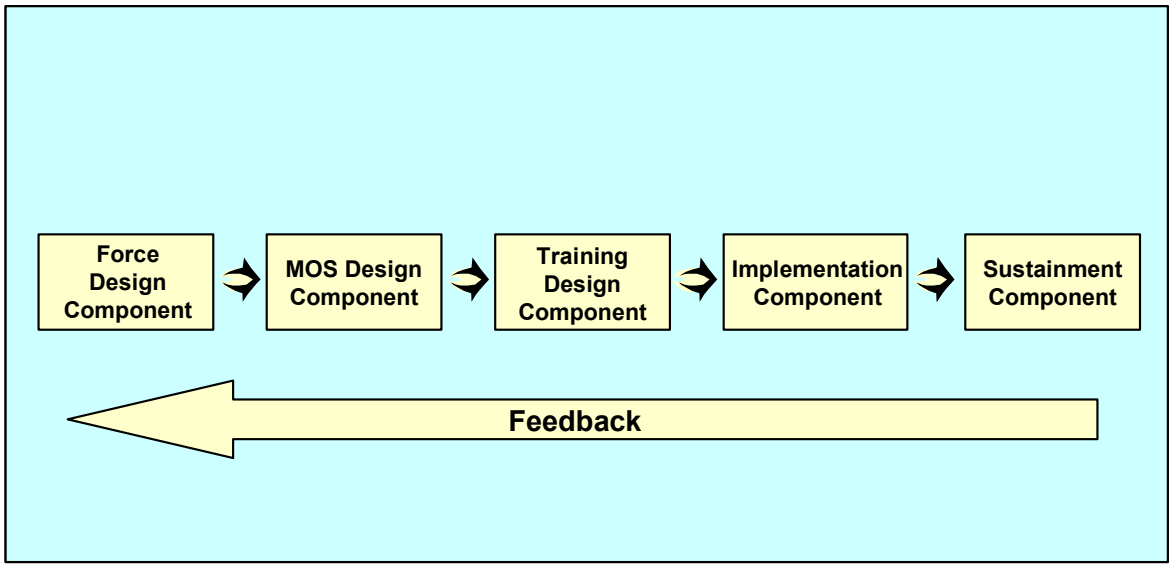

Figure 2. MSS Developmental Blueprint

Five major components are featured in the MSS Developmental Blueprint: force design, MOS design, training design, implementation, and sustainment. The process starts with a determination of the force design and proceeds to crafting an MOS structure to support the requirements of that force design. The results drive an assessment of the implications for the existing training paradigm and the adjustments, or even re-design, that may be required to implement the new MOS design. The next components of this MSS Blueprint address the considerations for implementing and sustaining the new MOS design throughout the institution. Each of the five components is detailed below.

Force Design Component

Figure 3 details the process by which force design and force structuring occur. That process begins with an exhaustive assessment of the future operational environment and the implications for the employment of military forces. Then, operational concepts are developed to deploy and employ forces in the most military efficient manner possible to accomplish anticipated missions. Ongoing efforts to craft the operational concepts for the OF are a vivid example of this activity. Once a set of operational concepts is in place, the next step is to develop and test force structures that can best execute those concepts across the full spectrum of operations. Next, force structuring takes place in a fiscally constrained environment to determine the mix of traditional, transitional, and new units that best meets the needs of the force. Costs and

tradeoffs get full attention here, as well as any associated risk connected with not fielding the optimum force. The next step is to consider a supporting job structure to support the force, with particular attention to re-designed and newly fielded unit structures.

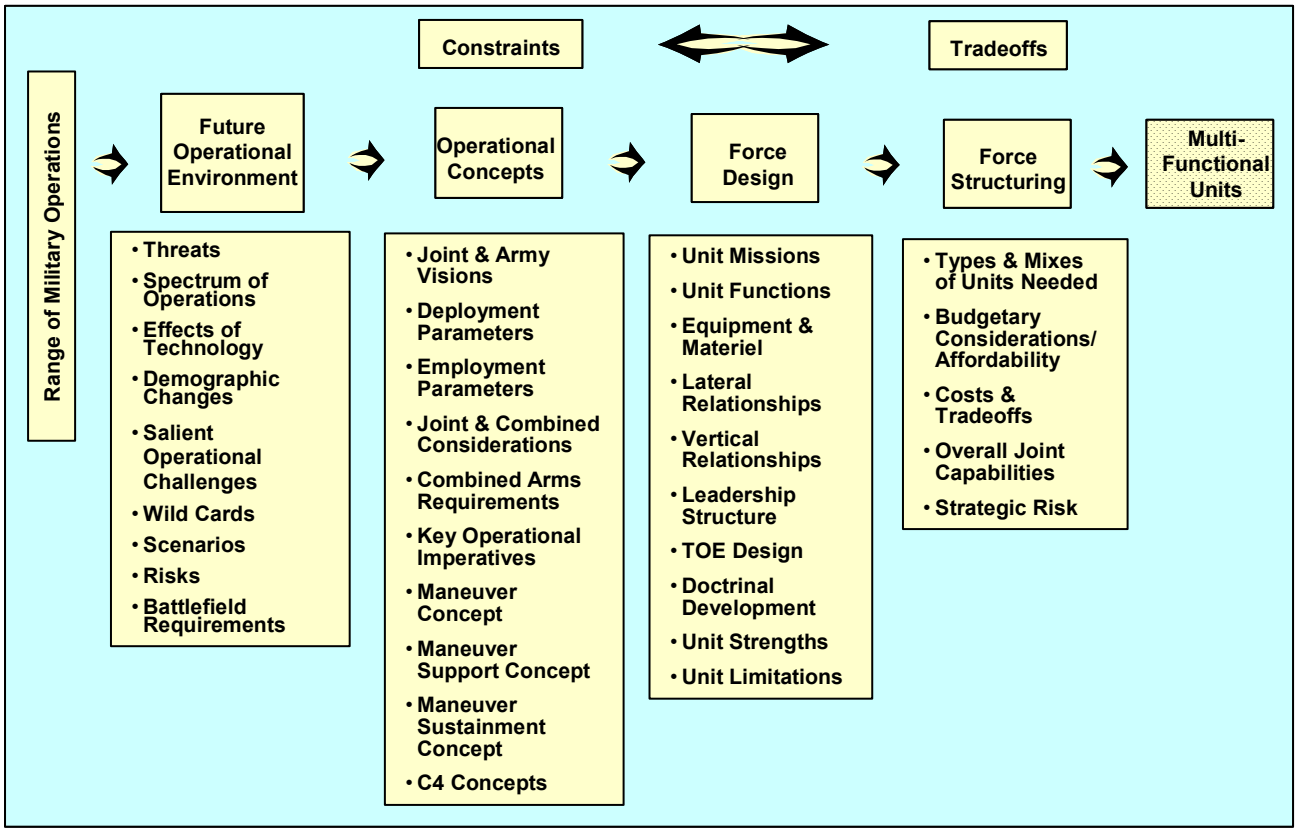

Figure 3. Force Design Component

MOS Design Component

The second component of the MSS Developmental Blueprint is MOS Design. Based on multi-functional units or units of action, job requirements can be formulated. The concept of duties as used in DA PAM 611-21, Military Occupational Classification and Structure (Department of the Army[DA], 1999) will be used as a means for describing job requirements. These link unit functional requirements to soldier job performance.

The goal of the MOS Design described here is to create a job structure that meets the requirements along the range of military operations in a way consistent with the existence of the OF, the Interim Force, and the Legacy Force. The general notion is to define a set of jobs that can be linked to the range of military operations.

Future Army requirements pose a rather complex set of conditions for the Army job structure. The structure must be flexible and scalable, accommodate different force

structures, respond to a variety of contingencies, be a positive and reinforcing factor in soldier performance and career development, and be managed efficiently, timely, and accurately by Army personnel and training planners and managers.

Figure 4 portrays the concepts underlying this component. The steps in this component can be described, from left to right. Analysis of the job structure begins based on an enumeration of the multi-functional units required to respond to a mix of operations along the range of military operations. Associated with these units is a set of functions. To accomplish the functions, soldiers must perform certain duties. Statements of duties are similar in format to those found in DA PAM 611-21 and describe work that soldiers must perform.

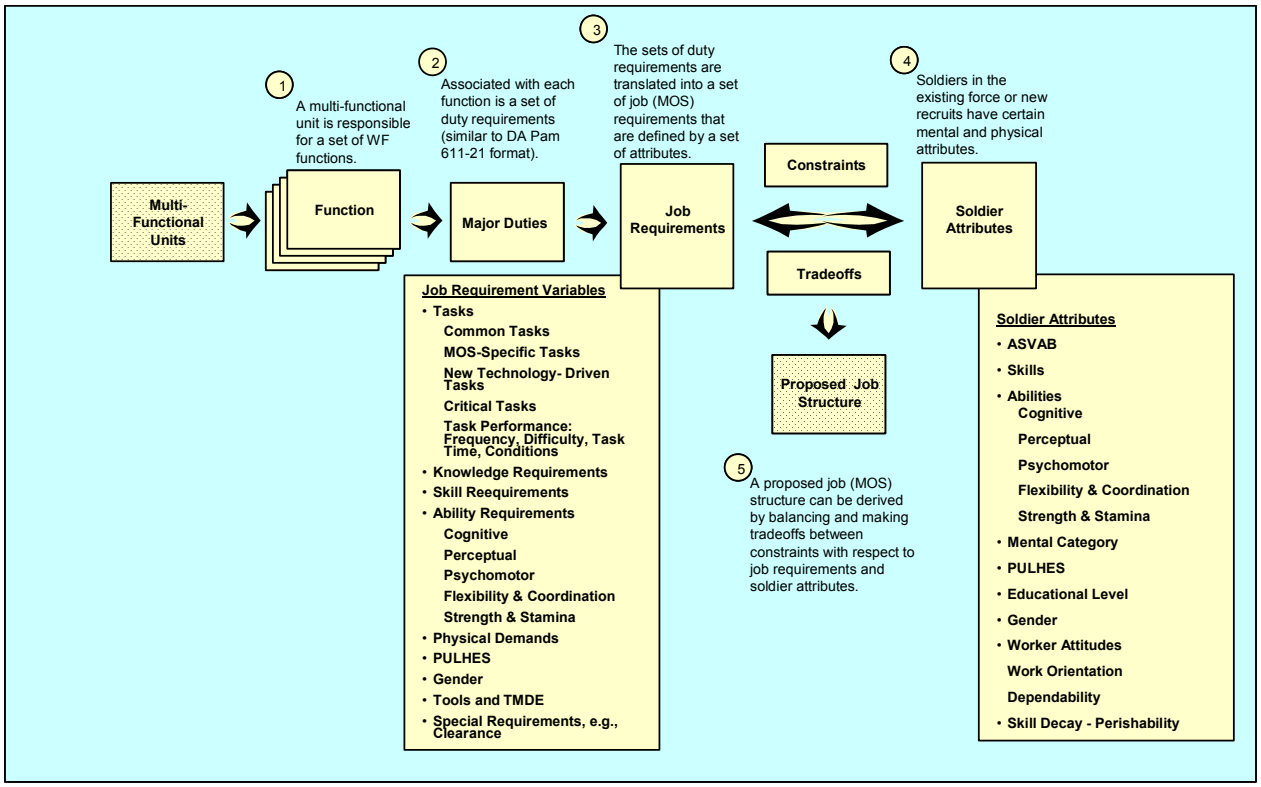

Figure 4. MOS Design Component

The duties can be organized into a set of job (MOS) requirements that can be described in terms of job-related attributes. Key among these is a set of tasks and related task performance attributes, knowledge requirements, and ability and skill requirements. There are others as well, including physical demands, gender, tools, test and measurement devices and equipment (TMDE), and special requirements. Not all factors are necessarily critical for consideration. In all cases, these attributes represent "requirements" that are embedded in the jobs that are required to satisfy the needs of multi-functional units.

The requirements do not necessarily define the job structure. Soldiers possess certain knowledges, skills, and abilities (KSA), of which some are inherent and others result from education and training. Some of these soldier attributes may be constraints with respect to job requirements. For example, future Army jobs may require greater cognitive ability than current jobs as a result of the introduction of more technology-based equipment. The recruiting pool might be characterized by a potential enlistee population without the requisite level of cognitive ability. In that case, cognitive abilities might be a constraint on the job structure design and, therefore, tradeoffs would have to be considered.

As a practical matter, analysts using the MSS Developmental Blueprint to design a new job structure, be it focused on multi-skilled soldiers or other concepts, need to isolate those job requirement variables and soldier attributes that are most critical. Their analyses would focus on the critical elements with secondary consideration given to other factors considered consequential.

A key in the job structure design is that jobs must be defined in terms of variables that lend themselves to scaling in response to changing mission requirements. The commonalities in terms of task sets, KSA, and other attributes need to be made visible so that planners can aggregate and disaggregate jobs with minimal disruption and loss of effectiveness.

Training Design Component

Once a job structure has been determined, attention must focus on developing a corresponding training concept. The approach to formulating a training concept should be compatible and supportive of TRADOC's approach to training, as outlined in TRADOC Regulation 350-70, Systems Approach to Training Management [SAT], Processes, and Products, which would be used in the course of training development (TRADOC, 1999). At this stage, the objective is to develop the basic training concepts.

Figure 5 illustrates the basic approach for arriving at a training concept design. The principal driver is the job structure formulated in the preceding component. Training requirements to support the job structure must be defined. There are both collective and individual training requirements. In regard to individual training, there is an existing model based on BCT, AIT, the Primary Leadership Development Course (PLDC), the Basic NCO Course (BNCOC), and the Advanced NCO Course (ANCOC). Alternative approaches have been discussed during the course of the Army's transformation planning. One alternative is based on warrior training, functional qualification training, unit-specific training, and self-development training. Whichever approach is chosen, there will be training requirements depicted in terms of training objectives, content, course length, among other parameters. Taken together, these requirements conceptually portray the training demands associated with the job structure.

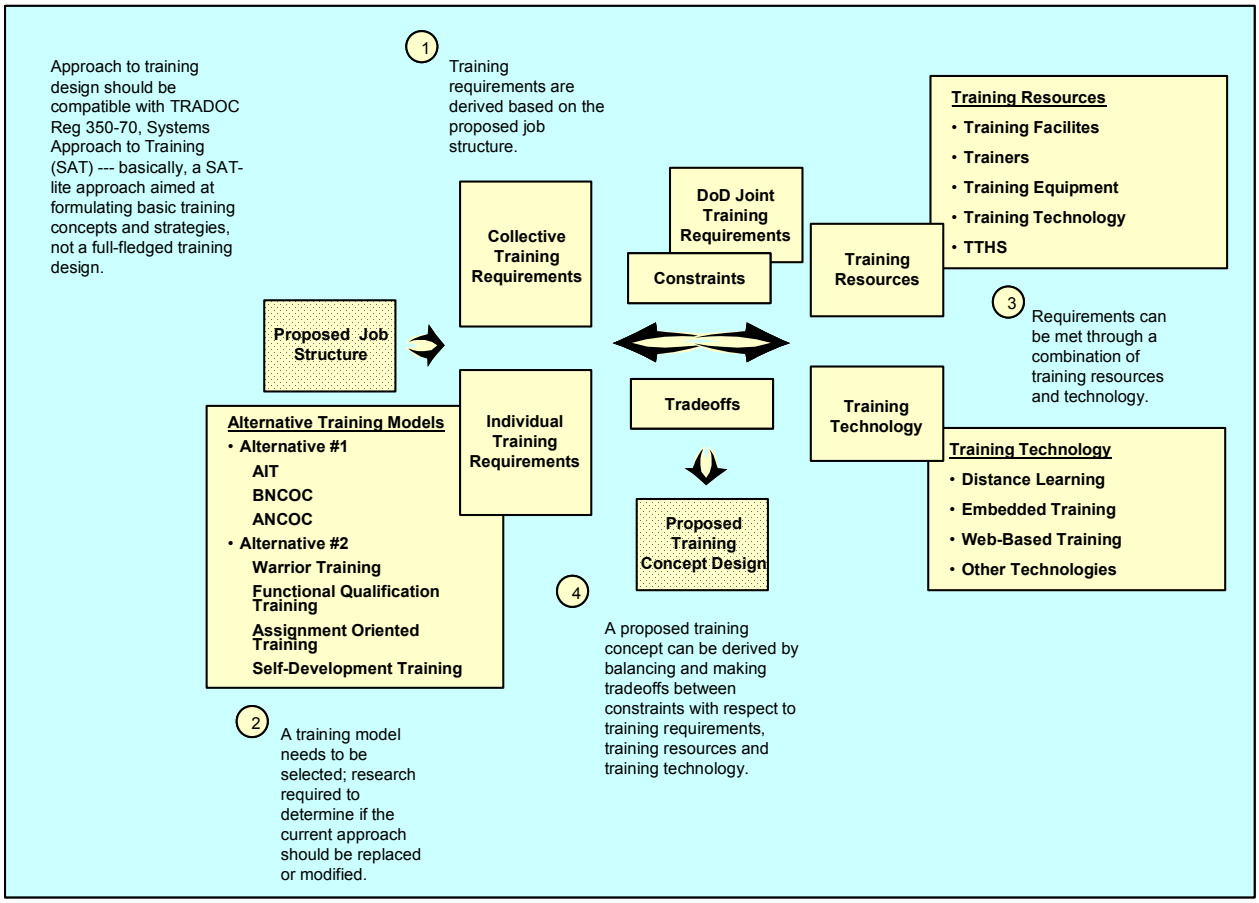

Figure 5. Training Design Component

The training demands must be weighed against the training resources and technology that are available to the Army. The training resources include facilities, trainers, training equipment, and training technology. Additionally, a key factor on the supply side is the TTHS account. Training technology can also be used to formulate the training strategy supporting the preliminary job structure. Advances in distance learning, embedded training, web-based training, and other technologies may leverage Army training resources, facilitating a different and perhaps more effective training effort supporting future job structures.

In order to match requirements with resources and technology, consideration must be given to constraints and tradeoffs. Constraints exist when combinations of resources and technology are not sufficient to meet the training requirements. In these instances, there may be shortfalls in meeting the demands. Or, there may be tradeoffs that will allow the Army to accommodate its needs. One particular consideration, the import of which will depend on particular situations, is the extent to which the Army has responsibility for training members of other Services.

After consideration of requirements, resources, and technology, a training concept design results from this component. This concept must then be considered in relation to the proposed MOS structure.

Implementation Component

Resolving issues pertaining to job structure design and training concept design do not, by themselves, complete the task of creating an improved job structure. Another major consideration that must be addressed is the transition from one structure to another. Implementation does not necessarily prevent adopting a new job structure but costs, delays, and disruptions may require tailoring the new job structure to minimize negative impacts. Figure 6 identifies implementation issues that must be considered and accommodated within the scope of the proposed job structure. Seven different areas require consideration.

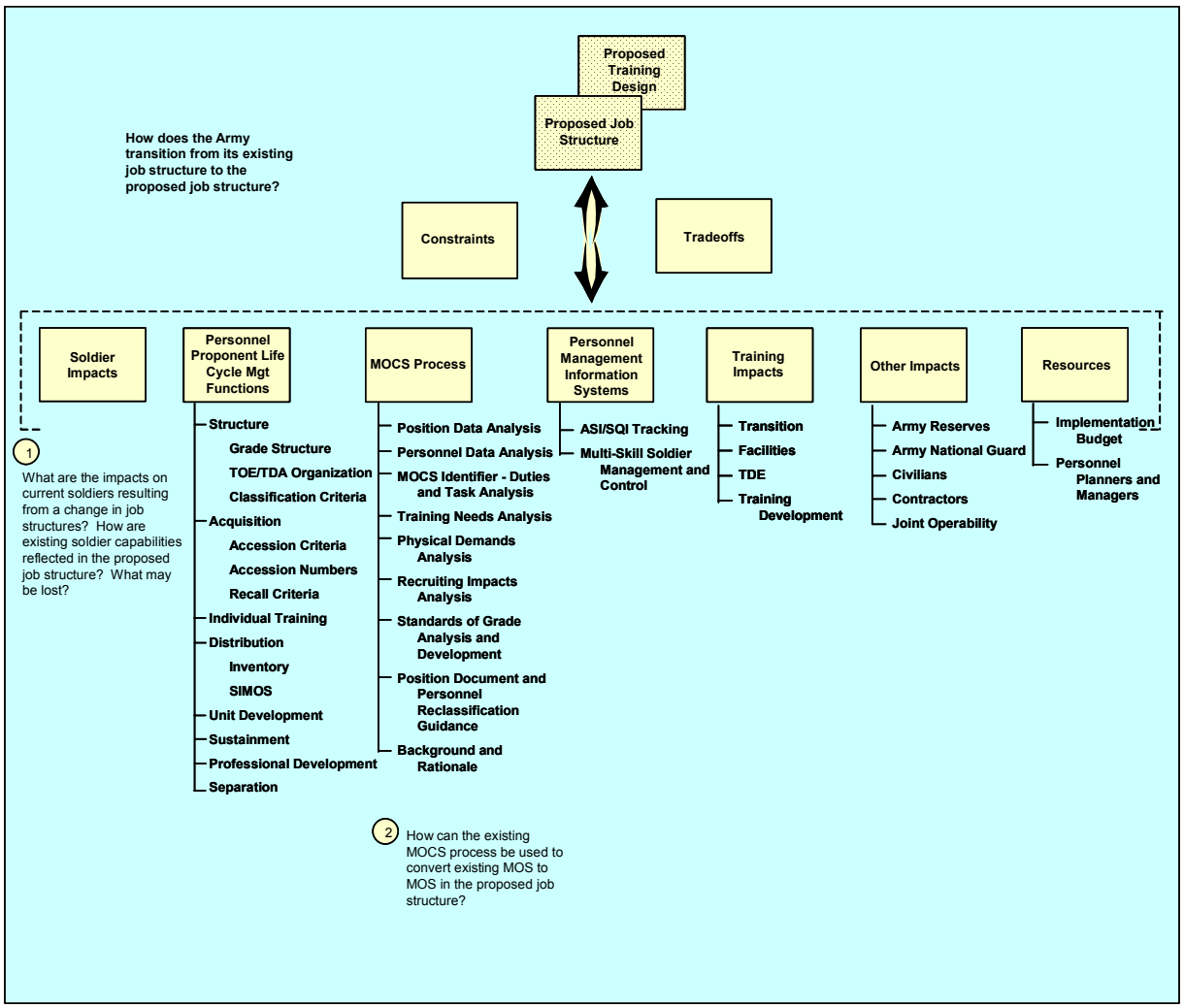

Figure 6. Implementation Component

The first area involves the impact of changing the job structure on soldiers currently in the Army. When careers have been built over years based on an existing job structure, changes can seriously affect morale if resulting changes in career opportunities, promotions, and work occur. These impacts need to be identified, their positive and negative effects should be assessed, and a determination of whether the proposed job structure may require modification must be made.

A second area that should be addressed is the transition impact on the personnel proponent life cycle management functions, as prescribed in AR 600-3, The Army Personnel Proponent System (DA, 1997). There are eight life cycle management functions, some more important than others in this context, but all requiring consideration. With respect to structure, how are grade structure, TOE/TDA organization, and classification criteria affected? What impacts result on accessions and recruitment? Issues of distribution and unit development must be addressed. Adopting a new job structure will impose changes on these management functions, all of which need to be explicitly identified and considered.

A third area involves the Army G-1's Military Occupational Classification Structure (MOCS) process, the procedure by which changes in Army job structures are documented and requirements established for implementation. Does the MOCS process need to be changed in order to transform the current job structure? If the underlying concept moves from a task-based approach to a competency-based approach, as some suggest, does the MOCS process have to be modified to accommodate such change?

A fourth area concerns the degree and manner that personnel management information systems need to change to accommodate a new job structure? To the extent the new job structure consists of MSS, how can the Army track and manage this expanded set of soldier capabilities? If Additional Skill Identifiers (ASI) or Special Qualification Identifiers (SQI) indicate the multiple capabilities, can systems be created to track these characteristics? If the job structure is scalable in order to respond to contingencies along the range of military operations, can management and control systems be created to support an ever-changing job structure?

A fifth area of consideration is the impact on training and the training establishment during the transition to a new job structure. Can changes be incorporated in the existing training program? Or, will the Army face a requirement to operate one training program to support Legacy and Interim Forces and another to train multi-skilled soldiers for their OF jobs? There is also the whole issue of training development. What is the magnitude of the effort and what are the timelines associated with training development?

A sixth area involves other transition impacts to be considered, chief among which are the effects on the U.S. Army Reserve, the Army National Guard, civilians, and contractors. Does the proposed job structure lead to a reallocation of

responsibilities among the different elements of the Total Army? The changes in Army job structure may reverberate widely. There also needs to be consideration of the effects on joint operations with the other Services.

Finally, a seventh area encompasses the resource issues underlying a transition to a new job structure. Depending on the scope of changes, there can be significant resource requirements. There must be sufficient budgetary resources to support transition efforts. Also, in many ways more critical to implementing job changes, what is the capacity of Army personnel planners and managers to execute the changes? Answers lie in the numbers of planners and managers available and in the experience and expertise they can bring to the process.

Before a job structure is finalized, the proposed courses of action must be weighed against these implementation considerations. While these considerations are generally transitory and their effects of limited duration, albeit possibly over a long time period, they must be thoroughly identified and deliberately addressed. Any is a potential showstopper, all the more painful if it comes as a surprise during implementation. As with the design process, constraints may result in shortfalls in one respect or another. This leads to looking for tradeoffs. The shortfalls and tradeoffs need to be made explicit.

Sustainment Component

In addition to viewing the job structure in the context of its implementation effects, consideration must also be given to the operational or sustainment aspects as well. While implementation focuses on one-time, transition changes, sustainment addresses the effects on on-going, related activities for the foreseeable future. Figure 7 identifies the elements requiring consideration. There are seven here as well, although not exactly the same seven, and all represent operational issues as distinguished from implementation issues. The impacts of changes on soldiers already serving in the ranks are not addressed here; however, considerations of battlefield effectiveness are. Issues pertaining to proponent personnel life cycle management, as well as personnel management information systems, require attention. How to manage a job structure that features adaptable soldiers involves both management and supporting information systems. Can the procedures and systems required by the job structure function effectively?

The MOCS process needs to function in a time frame that is compatible with the Army's requirements to modify job structures to meet contingencies. There are serious concerns across the Personnel Community that the current MOCS process cannot produce the necessary changes to job structure in a sufficiently responsive fashion to meet the time requirements of dynamic change associated with fielding the OF and implementing the MSS Concept by 2008. The ability of the MOCS process to support the on-going requirements of the proposed job structure should be addressed.

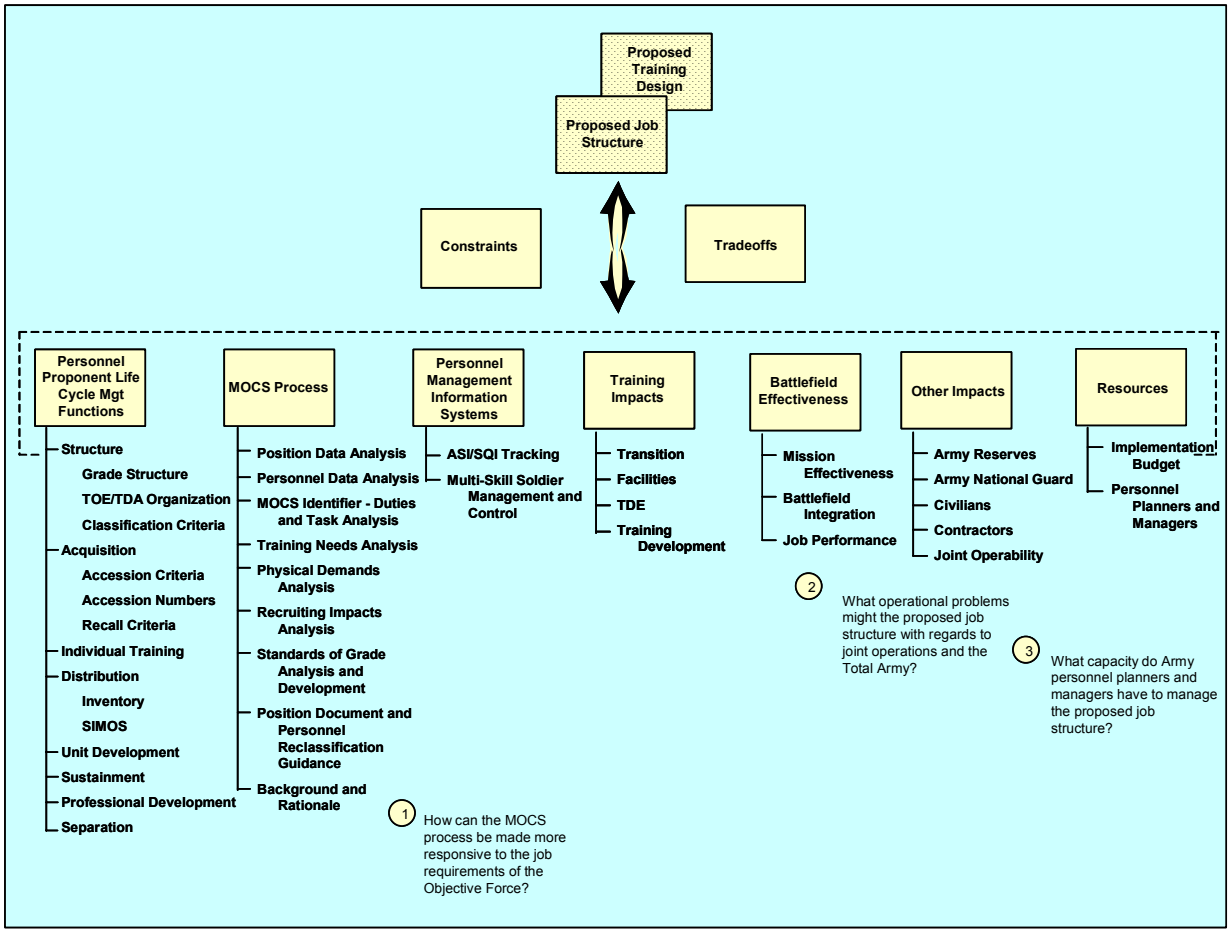

Figure 7. Sustainment Component

Operational issues with respect to training, Total Army impacts, and resources must again be assessed here. These include similar questions to those raised in connection with the discussion of the implementation component. Again, the capability of personnel and training planners and managers to operate in accordance with the proposed job structure should be a key consideration.

Operational effectiveness is an additional consideration on the sustainment side. Does the proposed structure achieve its objectives with respect to the operational environment? Three areas of inquiry are included. First, mission effectiveness is the ability of the Unit of Action to achieve its mission based on Army doctrine whereby the role of each MOS contributes significantly to mission achievement. Second, battlefield integration addresses the way in which the proposed MOS will operate within the unit in relation to other MOS, particularly in respect to functions on the battlefield; this is a focus on the collective impact of the MOS structure. Third, job performance, the ability of the soldier to carry out the duties and responsibilities encompassed in his MOS during operations, focuses on the individual's impact.

Like the preceding blocks, shortfalls and constraints here lead to a consideration of tradeoffs within the sustainment block. In addition, there may be changes in the implementation or design block that will lead to the best-proposed job structure.

Tradeoffs and Constraints

The restructuring of Army jobs so that they are more multi-skilled or otherwise different is constrained by any of a number of factors. The MSS Developmental Blueprint has identified many. To arrive at a final design, constraints must be identified, tradeoffs considered, and changes made so that the final job design is achievable. At the same time, attention must be paid to the tradeoffs to ensure they do not represent compromises that undercut the goals of the job restructuring.

The MSS Developmental Blueprint's formulation includes tradeoff and constraint analysis within the five components. Additionally, there is feedback between the components in an effort to arrive at the "best" job structure. Using the MSS Blueprint involves an iterative process of successively addressing constraints and tradeoffs until the most effective job structure can be identified.

Clearly, there are many variables and considerations that must be addressed. The MSS Developmental Blueprint, as described here, is aimed at making as many of these issues as visible and explicit as possible. Not all the issues identified need to be addressed all the time. Army personnel planners can use this Blueprint to define the scope of a proposed job restructuring effort, to prioritize and select issues that need to be addressed, and to make explicit the constraints and tradeoffs of a new set of jobs.

THE MULTI-SKILLED SOLDIER ROADMAP

In order to transform the current soldier to a multi-skilled soldier, the Army is faced with making a series of major decisions and initiating a set of key planning and implementing actions. This set of decisions and actions constitutes an MSS Roadmap, essentially a general planning approach for creating multi-skilled soldiers. Colloquially speaking, this Roadmap identifies the "major muscle movements" common to any selected course of action for MSS implementation and sustainment. The Roadmap is structured to indicate the pivotal steps required in the short-, near-, and long-term to emplace a functioning MSS system by 2008, at which time the first units of the OF should enter the force structure.

For ease of discussion and categorization, the actions addressed in this Roadmap have been associated with three umbrella organizational groupings: the Army Leadership, the Personnel Community, and the Training Community. The Army Leadership grouping includes the key Army civilian and uniformed leaders who make policy, provide recommendations, craft implementing guidance, and draft plans writ large for the Army as a whole. Included among the Army Leadership, for example,

would be the Secretary of the Army, his Undersecretary and Assistant Secretaries, the Chief of Staff of the Army, the Vice Chief of Staff of the Army, other Army full generals, and principal members of the Army Staff, as well as selected Army civilians and general officers of lesser grade.

The Personnel Community encompasses all those in the Army responsible for recommending, making, and implementing personnel policies, plans, and procedures. Prominent within this community are the Army G-1, the Commanding General of the U.S. Total Army Personnel Command (PERSCOM), the principal personnel staff officers and personnel proponents for each of the Army's major commands (MACOMs), and the branch personnel proponents.

The Training Community refers primarily to those leaders within the Institutional Army responsible for education and training policy, devising training approaches, and executing education and training courses from basic training through the Army War College. The Training Community is also responsible for assisting operational units in designing and executing training by providing a broad spectrum of doctrinal and procedural publications, training aids, and distance learning courses. Most prominently, the term Training Community in this report refers primarily to TRADOC Headquarters, East and West, the training centers, and the subordinate system of branch and functional schools.

Approach

Figure 8 provides a generic overview of the actions required to implement the MSS Concept. Activities fall within the purview of each of the three major organizational groupings that would play a leading role in the process. The activity blocks not only indicate the major set of implementation activities but also suggest their sequencing. The timing as well as level of effort is dependent on the availability of resources and the commitment of the Army Leadership. The more resources available, the more quickly the change may occur. In like manner, the more commitment evident in the Army Leadership, the more likely timely decisions will be made and vigorously pursued in a prioritized and decisive way.

The timeline also reflects the existence of the three different Army forces (Legacy, Interim, and Objective) that will co-exist for many years after multi-skilled soldiers start entering the force. Changes to the Army's job structure must occur in a way that supports the operational requirements of all three of these forces, as well as of the U.S. Army Reserve and U.S. Army National Guard.

Generally speaking, the Army Leadership must first establish overall policy and direction with respect to creating multi-skilled soldiers. In short, the Army Leadership must frame the effort, motivate the institution, fence the necessary resources, and otherwise accelerate the impetus for change. Next, there are activities that both the Personnel and Training Communities must pursue. Many, if not most, of these early actions can proceed in parallel in order to facilitate implementation in the most time-

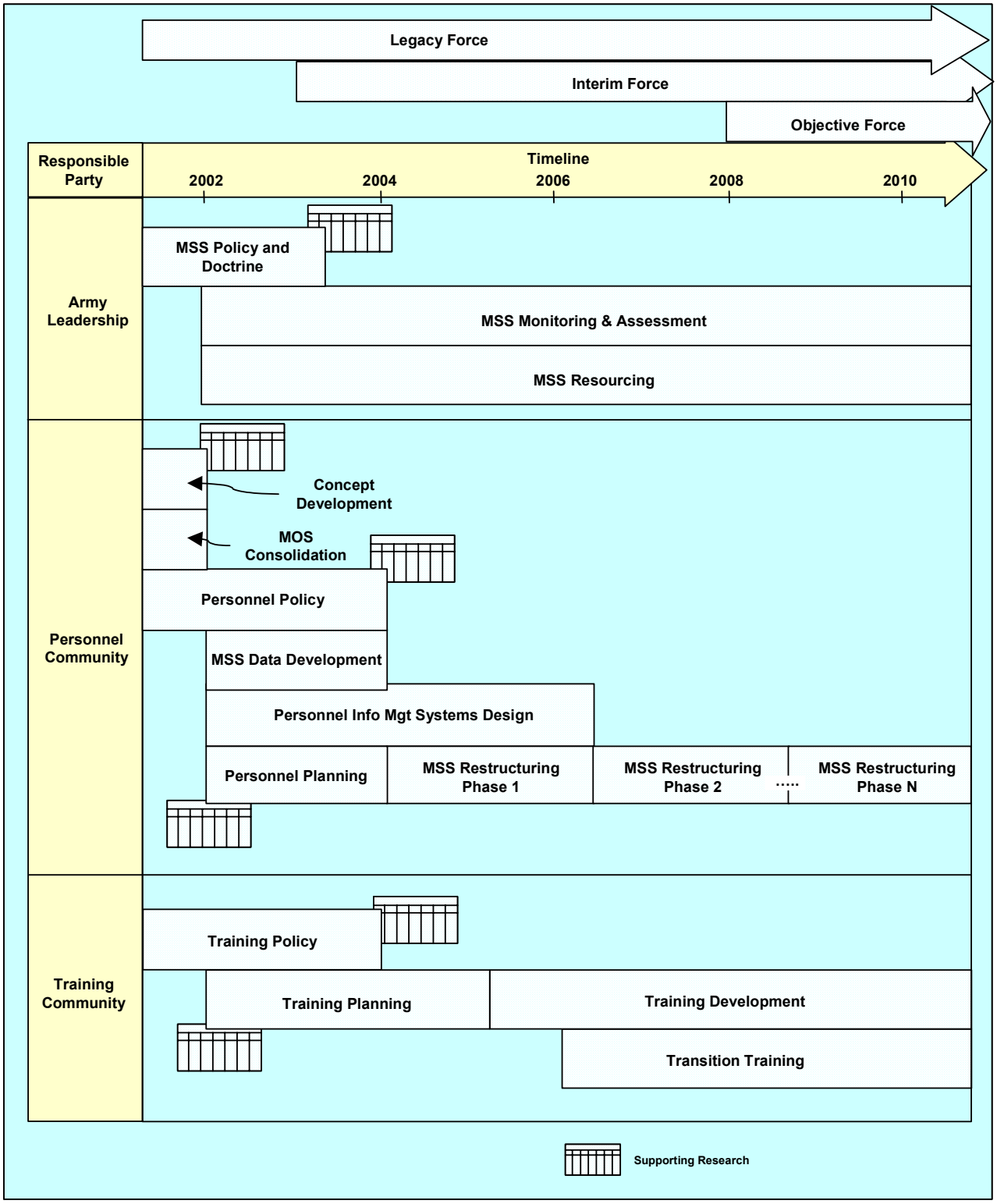

Figure 8. MSS Roadmap Overview

efficient manner. Supporting these efforts, and in some instances preceding them, are requirements for behavioral and training research to answer critical questions posed by

the challenges inherent in the MSS Concept. Some of the research questions must be addressed at an early stage to assist in initial implementation design, and others may be addressed at a later stage to help refine ongoing approaches for implementation and sustainment. These research requirements will be highlighted later in the follow-on discussion of the MSS Study Plan.

Army Leadership

The Army Leadership plays the most pivotal role in generating the momentum for implementing the MSS Concept, particularly because of the profound "grass-roots change" involved from how the Army's Personnel and Training Communities conduct business today. Table 1 depicts the three critical areas involved and outlines the major actions within them that the Army Leadership must take in order to build and sustain this momentum.

First, the leadership must establish overall policy and doctrine regarding multi-skilled soldiers. This policy process should:

1. Define clearly and definitively the MSS Concept for the Army,

2. Develop and assess comprehensive, integrated implementation options,

3. Select an option,

4. Provide guidance and direction by publishing an Army Master Implementation Plan inclusive of milestones, priorities, timelines, and responsibilities,

5. Determine and initiate changes required to existing Army policies, and

6. Charter the necessary doctrinal work.

An important part of defining the approved MSS Concept involves deciding whether to adopt a competency-based system or to maintain the present task-based approach to Army jobs. In chartering the supporting doctrinal efforts, the Army Leadership should present a strong case for the value added by the multi-skilled soldier to the Unit of Action, as well as to other unit configurations of the OF. In a similar vein, MSS enhancement to the capabilities of the Legacy and Interim Forces along the range of military operations should also be thoroughly articulated. Not only will such explanations provide further clarity in intent, but they will also assist significantly in justifying to the Army as a whole and to the public generally the significant level of effort and costs associated with the ensuing implementation process.

Second, given a decision to proceed with MSS implementation, the Army Leadership must monitor the implementation process to ensure it unfolds in a comprehensively integrated and coordinated fashion, especially relative to the actions of the Personnel and Training Communities. A periodic review process should be

	Near Term (2002-2004)	Mid Term (2004-2006)	Long Term (2006-2008)
Policy and Doctrine	• Clearly and definitively define the MSS Concept for the Army • Develop comprehensive implementation options for consideration • Select an implementation option • Determine development & implementation priorities • Determine phasing and proponent agencies • Develop the Army Master MSS Implementation Plan • Determine changes to Army policies required to support MSS implementation • Charter doctrine changes to support MSS • Consider impact on leader development • Consider impact on Reserve Component	• Adjust Army policies to support MSS implementation • Adjust Army Master Implementation Plan • Oversee continued doctrinal development	• Adjust Army policies to support MSS implementation • Adjust Army Master Implementation Plan • Ensure needed doctrinal changes are completed • Prepare the Army as a whole for the MSS • Prepare the public for the MSS
Monitoring & Assessment	• Establish comprehensive HQDA oversight mechanism	• Exercise HQDA oversight of the entire MSS implementation process • Monitor execution of implementation of plan milestones • Ensure implementation efforts are fully integrated across the Army	• Exercise HQDA oversight of the entire MSS implementation process • Monitor execution of implementation of plan milestones • Ensure implementation efforts are fully integrated across the Army
Resourcing	• Cost out all MSS implementation options under consideration • Phase the resources to implement the selected MSS option (financial, human, equipment, construction, re-stationing, and other materials) • Establish POM line and program near-term funding/Fund initial phase immediately	• Update costs • Continue to program adequate funding by phase • Provide sufficient resources in all categories	• Update costs • Continue to program adequate funding by phase • Provide sufficient resources in all categories

Table 1. MSS Roadmap (Army Leadership)

established to monitor progress and to trigger required changes or adjustments to the base plan. This requires Headquarters, Department of the Army (HQDA), to establish and maintain an effective oversight mechanism. It also requires a subordinate organization with responsibility for day-to-day, cross-functional orchestration of the implementation process. A viable approach would be to assign the primary oversight function at HQDA to a single staff directorate while assigning the day-to-day management and integrating functions to a single MACOM or to a task force reporting directly to HQDA.

Third, MSS implementation plans must be properly resourced in terms of general funding, personnel, equipment, construction, and other materials. For this reason, all implementation options under consideration should be fully costed out as part of the decision-making process. Once an option is selected, it must be properly resourced by phase. The required resources include planners, managers, and developers in sufficient numbers for both the Personnel and Training Communities.

Personnel Community

As shown in Table 2, there are six major areas of implementation focus for the Personnel Community: concept development, MOS consolidation, personnel policy, data development, information management systems development, and personnel planning and re-structuring.

An initial effort for the Personnel Community is to recast the MSS Concept into an operational model, process, or set of procedures that can be used as a planning tool in analyzing and assessing specific multi-skilled soldier personnel options. Planners could then use this tool as part of a standard, systematic approach to address the many issues involved in transforming the current Army job structure to one featuring multi-skilled soldiers. This methodology would help ensure that all associated constraints and tradeoffs are explicitly addressed in constructing viable personnel options for consideration and ultimately in selecting one for implementation.

Second, since the current MOS structure will serve as the baseline from which the transformation to multi-skilled soldiers will occur, an interim step on the path to the MSS is to identify MOS consolidations based on the current job structure. The ADS XXI Task Force identified numerous potential MOS consolidations, deletions, and other changes in order to optimize the MOS structure. An assessment of the feasibility of these proposed changes aimed at optimizing the current MOS structure will provide a more effective point of departure for determining multi-skill opportunities. The Task Knowledges Commonality Analysis Method (TKCAM), an ARI technique that has been used in the past to assess the feasibility of restructuring more than 25 MOS, could be used for these purposes (Akman, 1998). However, MOS consolidation must be synchronized with the multi-skill requirements under consideration for the OF. Otherwise, it is possible that MOS consolidation could work at cross purposes with MSS implementation.

	Near Term (2002-2004)	Mid Term (2004-2006)	Long Term (2006-2008)
Concept Development	• Derive operational model from MSS Blueprint to use in evaluating MSS personnel concept options • Develop MSS personnel concept options • Select MSS personnel concept option to implement • Consider impact on Reserve Component	• Refine concept as needed	• Refine concept as needed
MOS Consolidation	• Determine priorities for continued MOS consolidation • Continue current MOS consolidation process	• Continue MOS consolidation	• Complete MOS consolidation

Personnel Policy	• Develop MSS-specific personnel policies
	  ○ Selection criteria
	  ○ MOS structure & Classification process
	  ○ Job categories to be multi-skilled
	  ○ Secondary job attributes
	  ○ Restructuring priorities
	• Wargame MSS implications thru life cycle of the soldier/ Determine related policy & process changes
		• Test & expand MSS-specific personnel policies and procedures
		• Develop career progression scheme for the MSS
		• Prepare personnel community for MSS approach & policies
			• Prepare Army for MSS personnel approach & policies
			• Ensure all supporting MSS personnel policies & procedures are fully developed and in place
			• Emplace career progression scheme for the MSS
			• Adjust existing policies

MSS Data Development	• Determine supporting data requirements • Develop data collection plan • Start gathering needed data • Start building supporting data bases for MSS	• Continue gathering data • Gather data from MSS test groups • Build data bases	• Complete supporting data base for MSS • Gather data from MSS test groups
Info Mgt System Development	• Develop process to track additional skills in MSS • Develop plan & taxonomy for additional skill identification	• Emplace/test additional skill tracking system	• Emplace complete data gathering process for MSS
Personnel Planning & Restructuring	• Develop master personnel implementation plan for MSS ICW Army's Master Implementation Plan • Start restructuring soldier jobs into MSS jobs • Conduct behavioral research in selected topics	• Continue behavioral research • Continue MSS job restructuring	• Continue behavioral research • Complete MSS job restructuring

Table 2. MSS Roadmap (Personnel Community)

Within the framework of the Army's policy regarding multi-skilled soldiers, there is the need for more detailed personnel policy. Among the more immediate issues to be addressed are changes in selection criteria, modifications to increase the

responsiveness of the existing MOS structure and classification process, job categories to be multi-skilled, primary and secondary job attributes to be used in describing multi-skilled soldiers, and restructuring priorities. In the mid-term, these policies and related procedures should be tested, refined, and expanded. As the implementation process unfolds, a career progression scheme for the MSS must be developed and emplaced, and both the Personnel Community and the Army as a whole must be properly prepared for full institution of MSS personnel procedures and techniques.

A fourth area of activity that the Personnel Community needs to pursue is the development of data required supporting an MSS job structure. Much of the current data, to the extent they exist, are task-based. If the Army pursues a competency-based system, there will be a need to supplement existing data with substantial data development. Creating a database supporting the decisions required for a competency-based, multi-skilled soldier would be a major undertaking.

Fifth, there is a need to develop personnel information and management control systems supportive of a multi-skilled soldier approach. Current systems need to be evaluated to determine how they can be used to support new requirements. A major challenge, however, will be to design and develop capabilities to manage the "multi-skill" aspects of a new job structure. Based on past experience with tracking and managing additional skill identifiers (ASI) and specialty qualification identifiers (SQI), significant challenges in this area will have to be overcome.

A sixth area of responsibility involves the planning and restructuring that actually changes traditional soldier jobs to multi-skilled jobs. One aspect is designing multi-skilled jobs; this would be based on applications of the MSS Developmental Blueprint. In addition, the planning would lead to establishing methods to document and implement the job changes, building upon the existing MOCS process to improve responsiveness in general and to facilitate tracking multi-skilled soldiers. Table 2 indicates that the job restructuring would occur in phases, the number and scope of which would be determined during initial planning.

Finally, there will be implementation actions to change existing jobs to multi-skilled jobs. This will involve actions affecting soldiers currently in the force as well as new entrants.

Training Community

The Training Community has responsibilities of its own in the development and implementation of the MSS Concept. In many ways, because of the resource-intensive nature of its requirements, the actions required by the Training Community probably demand the longest lead times within the entire MSS implementation process. As depicted in Table 3, those actions fall into three major categories: training policy, training planning and development, and transition training.

	Near Term (2002-2004)	Mid Term (2004-2006)	Long Term (2006-2008)
Training Policy	• Develop Concept for future training paradigm (incl scope) • Determine changes to leadership development paradigm • Consider impact on Reserve Component • Determine future role of branches • Determine changes to training base • Develop master transition concept for Training Community	• Begin implementing master transition plan in earnest • Adjust training base as planned • Review Objective Force requirements • Adjust master plan as required	• Prepare Army as a whole for new training changes • Publish supporting training documents
Training Planning & Development	• Redesign BCT & AIT • Determine additional skill modules • Design of unit-of-assignment training • Develop DL support concept • Determine transition resources • Develop construction plan • Develop re-stationing plan • Develop transition plan for the Training Community • Plan to acquire sufficient number of training developers • Develop DL support plan • Test DL methodology • Conduct behavioral research in selected supporting topics	• Program transition resources • Start required construction • Develop supporting DL courses • Start implementing transition plan for training base • Test new training paradigm courses with control groups (soup-to-nuts) • Develop initial entry base courses • Develop additional skill modules • Develop UOA courses • Develop DL courses • Develop plan to modify leadership courses for the MSS • Expand inventory of training developers • Continue behavioral research	• Position training personnel, materials, & equipment for full-scale execution • Refine plans for eventual NCO training of multi-skilled soldiers • Fully resource training base for execution • Complete required construction • Expand/test DL courses and methodology • Adjust leadership courses to prepare for MSS • Continue behavioral research
Transition Training	• Develop a training transition plan	• Prepare initial training base cadre • Set up required courses	• Test all courses with larger & larger control groups

Table 3. MSS Roadmap (Training Community)

With respect to training policy, the Training Community must first determine whether to continue using the current branch-centric training paradigm or design an alternative one. The current training program may not optimally deal with requirements for multi-skilled soldiers or their leaders. Already the Army is considering a warrior-based training model coupled with special emphasis on soldier self-development and "life-long learning" to address specifically the requirements of multi-skilled soldiers related to adaptability, skill decay, and refresher training.

Similarly, the entire model for leader development training should be re-considered in light of the implications of the MSS Concept. Specifically, what changes should be made to facilitate the career progression of the multi-skilled soldiers as they advance through the NCO ranks, and what changes should be made to prepare leaders who are already in the force, especially NCOs and junior officers, for MSS implementation?

A pivotal part of the equation involves questions surrounding the future role of the branches. Throughout the Army's history, the branches have played the primary role in all aspects of institutional training. Altering that role significantly involves fundamental change to the Army's modus operandi and culture. However, as soldiers are increasingly trained in skill sets that cut across traditional branch lines and as units are structured in an increasingly combined-arms fashion, how branches' roles change in designing and administering training? Will training become less branch-centric? If so, how and when will this transition occur? What adjustments must be made to the training base to make this happen? These questions must be addressed in building a master training transition concept for the Army, a key early task since the associated execution time line will likely involve phases measured in multi-year increments.

A second area of training responsibility is planning and development. This area is where the heavy lifting will be done by the Training Community to prepare the way for the arrival of multi-skilled soldier trainees. It involves translating changes to the training paradigm into redesigned programs and courses, ensuring that they are tested, validated, and fully in place before MSS training is scheduled to commence in earnest. Such efforts should be part of a master transition plan for the Training Community that should be drafted at an early stage and continually updated to support the Army's Master MSS Implementation Plan. In part, this plan would trigger necessary subordinate plans, including a construction plan, a re-stationing plan, and a transition resources plan. In addition, this category of action would involve the design of a future DL concept to meet the needs of the Army once the MSS enters the force. The concept would then have to be implemented through the evolution of pertinent DT and DL methodologies, architectures and course packages. This effort alone would require many additional human and material resources, as well as significant in-house training and re-structuring. In particular, the Army would have to profoundly increase its current inventory of training developers to support and sustain the enormous preparatory and follow-up training redesign efforts involved.

A third area of training responsibility involves transition training. If the Army adopts a multi-skilled soldier approach, soldiers already in the force will have to be re-trained, or transitioned, so that they can perform effectively in their newly structured jobs. In addition, leaders will have to be prepared for integrating the new multi-skilled soldiers into their units. This transition training may be facilitated by the considerable training and unit experience that many of them would have. DT and DL will likely be required to play a major role in this transition training. The cadre for the initial entry training will also have to be prepared for its role in shaping new soldiers, employing methods that differ significantly, at least in many respects, from today's training approaches for BCT and AIT. In order to focus and organize these efforts, the Training

Community should construct a transition training plan as a component part of its master transition plan as soon as practicable.

THE MULTI-SKILLED SOLDIER STUDY PLAN

The issues surrounding the questions of whether to adopt the Multi-Skilled Soldier Concept, how to define that Concept for the purposes of implementation, and what courses of action should be considered are, in significant ways, matters of the human dimension. This section identifies behavioral research that explores the limits of human cognitive potential on a fairly broad front, as well as develops or refines techniques and approaches for structuring jobs, training, and learning in ways intended to support MSS development. This kind of research can also help avoid initial approaches and designs that may inadvertently exceed the range of realistic cognitive expectations for the general population of future recruits.

One of the major challenges facing the Army is that MSS implementation requires background information from research that has largely not yet been conducted for the peculiar set of conditions and parameters connected with the MSS Concept. In many ways, adopting the MSS Concept involves navigating through uncharted waters. It is highly prudent, therefore, to conduct critical, selected behavioral and other research in order to identify feasible courses of action within which adjustments and refinements can be efficiently accommodated as the MSS Concept is instituted.

Approach

This MSS Study Plan identifies research issues that, when addressed, will contribute significantly to the development and implementation of the Multi-Skilled Soldier Concept. These questions involve a variety of salient policy, personnel, and training issues that can be addressed through studies or research and development projects.

Research issues were identified based on information gathered in the various interviews and meetings conducted during the data collection phase of this project. In attempting to determine the more pressing studies for consideration, the thought process outline in Figure 9 was applied in conjunction with the MSS Roadmap. The research projects were organized based on requirements potentially facing the Army Leadership, the Personnel Community, and the Training Community. Tables 4 and 5 list a number of recommended research projects to be performed immediately, as well as in the near term, mid term, and long term in order to address the issues. These projects represent both basic and applied research, and are listed generally in order of importance within each of the matrix boxes. All of the recommended research and analysis projects are detailed in Appendix B

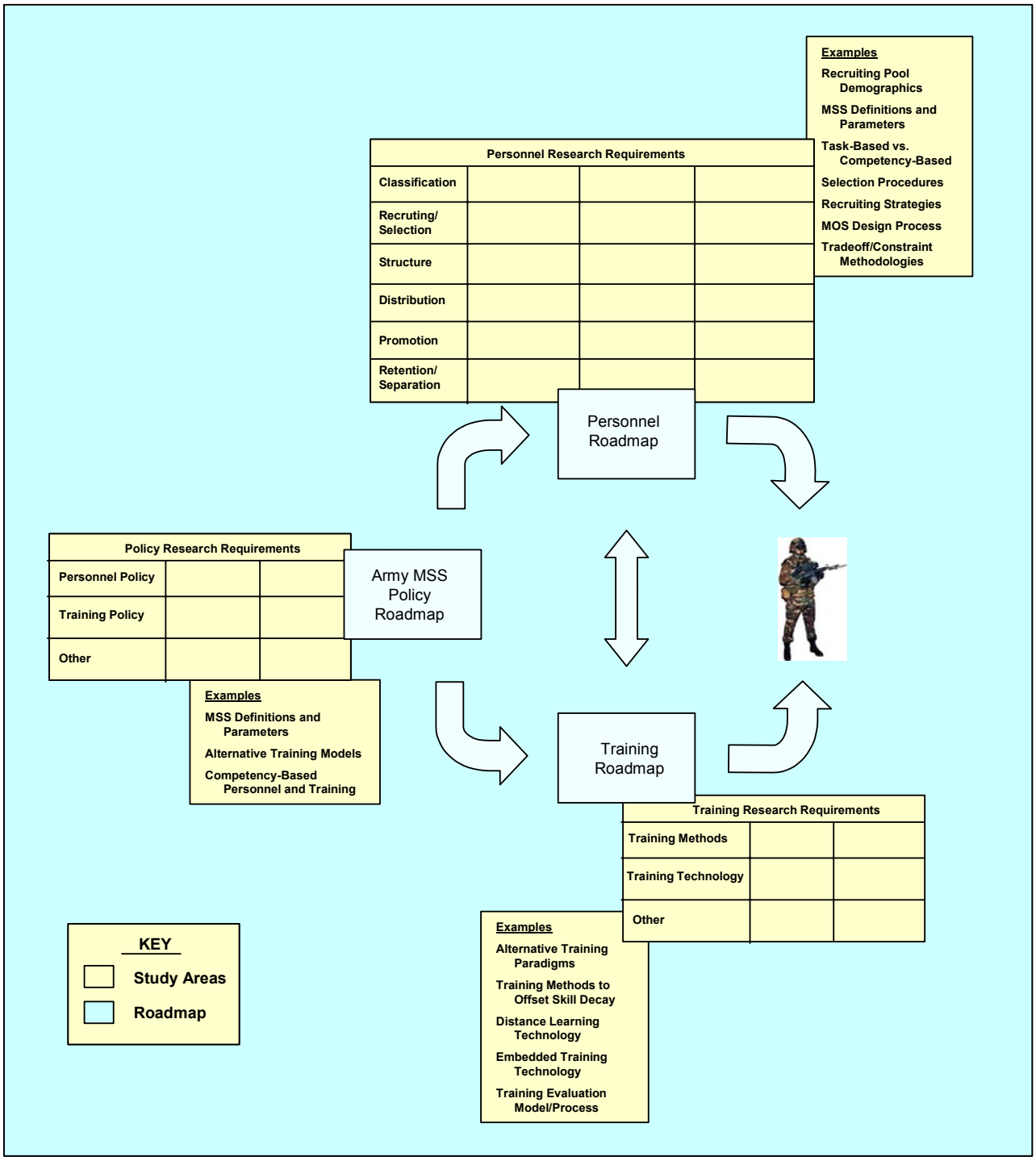

Figure 9. Approach for Determining Research and Analysis Projects

	Immediate	Near Term (2002-04)
Army Leadership		• Determine applicability of MSS Construct to Legacy & Interim Forces • Determine impacts of MSS on the Army's Reserve Components (RC)
Personnel Community	• Prototype MSS skill database • Continue the efforts to examine MOS for possible consolidation in synchronization with MSS prototyping for the Objective Force • Identify ways to accelerate and expedite the MOCS process to meet MSS timelines and requirements	• Determine performance and cognitive limits on MSS • Develop principles for identifying and categorizing jobs requiring multi-skilling • Determine implications between task-based and competency-based approaches to job structuring and learning • Identify KSAs associated with effective performance of tasks in an MSS environment • Determine mitigating approaches to lessen the impact of skill decay on MSS Performance • Determine how recruiting pool demographics (2005-2010) potentially impact MSS
Training Community	• Prototype MSS for the Objective Force Unit of Action and identify models for possible skill combinations based on operational needs • Begin a parallel process to determine what skill combinations would also most benefit the Interim and Legacy Forces	• Determine "best practice" methods for designing curriculum & learning strategies for complex jobs • Determine the "best practice" approaches for integrating distance learning (DL) into the training & educational design of the MSS • Determine best methodologies to motivate and facilitate the perpetually learning MSS

Table 4. Immediate and Near-term Research and Analysis Projects

The list of studies was compiled using a resource-unconstrained approach. Not all the studies must be pursued in order to implement and sustain the MSS Concept successfully. The list reflects those issues and associated studies that would ideally be pursued "in the best of all possible worlds" to inform the implementation process in the most comprehensive and time-phased fashion possible. It thus serves as a strawman against which to select studies for pursuit in a more resource-constrained environment. Also, as the MSS is defined definitively and as specific and detailed courses of action are considered, additional issues will emerge demanding research, and issues already listed may recede in comparative importance.

Additionally, there is no intended suggestion that each of these studies requires the same amount of time to complete, or that any study necessarily requires an extensive amount of time to reach meaningful and important results. In fact, many, if

not most, of the studies are envisioned as adaptable to "quick-look" methodologies if the MSS implementation process requires best-estimate answers, insights, findings, and recommendations in accordance with significantly accelerated timelines.

Immediate and Near-term Research and Analysis Projects (2002-04)

The greatest impediment in the near term to pursuing research issues is the lack of a clear, approved definition of the MSS Concept. Prior to the establishment of such a definition, near-term research should focus on those basic questions that must be addressed to lay a basis for follow-on research or that are critical for the early consideration of implementation and sustainment courses of action. Moreover, the immediate and near-term studies must be largely geared to those aspects of the multi-skilled soldier that are most likely to be incorporated into any approved MSS Concept. Chief among such aspects are the following:

1. The number and variety of skill sets a soldier will be required to learn and sustain will increase considerably

2. The complexity of most, if not all, MOS will increase significantly

3. The soldier must be more adaptable in applying learned skill sets to new situations and conditions

4. Training and personnel approaches must be oriented to enable and motivate soldiers to assume greater personal responsibility for expanding and sustaining complex, diverse skill sets once they complete their initial entry training

The immediate and near-term research efforts detailed in Table 4 are envisioned as high impact, short duration efforts in order to inform the early phases of MSS implementation design.

Mid-term Research and Analysis Projects (2004-06)

The mid-term studies are not critical for informing the early stages of MSS Concept design or course of action development, but are important for supporting the early stages of implementation. These studies, for example, would address issues embracing the life cycle of the soldier, such as recruiting strategies, selection and classification approaches, career progression paradigms, as well as junior leadership challenges, personnel management considerations, data system development, and technology integration designs.

Long-term Research and Analysis Projects (2006-08)

These studies focus principally on refining processes already underway or about to commence as full-scale MSS training draws near. More specifically, they involve

developing and validating predictive and measurement tools, adjusting subordinate training and personnel methodologies based on initial test group experiences, fine tuning course materials and aides, and ensuring that sustainment processes are in place.

	Mid Term (2004-06)	**Long Term (2006-08)**
Army Leadership	• Develop transition concept to MSS for Legacy & Interim forces • Develop MSS transition concept for the RC	• Conduct overall assessment of the implementation & sustainment process • Determine follow-on studies required to support MSS
Personnel Community	• Determine demands of managing a force of highly skilled soldiers • Develop career progression paradigm for MSS • Determine career progression impacts of MSS on entire force • Determine strategies to transition Legacy & Interim soldiers to MSS paradigm • Determine cognitive/ emotional demands for soldiers in multi-functional units • Develop and validate selection methods for MSS • Develop/validate classification approaches for MSS • Determine recruiting strategies for MSS • Develop MSS planning/ management data requirements • Determine uses of existing personnel resources & systems to support MSS	• Develop and validate selection tools for MSS • Develop/validate classification tools for MSS • Develop/validate additional predictive & assessment tools relating to impacts of MSS across all the soldier life cycle functions
Training Community	• Determine junior leadership requirements associated with the MSS • Develop/validate career-long training methods for MSS • Determine best mix of technology use for MSS residential & distance learning • Develop MOE to predict & assess MSS performance levels • Determine skill retention & sustainment requirements • Explore technology design approaches that shorten time for both initial and refresher training • Determine uses of existing training resources& systems to support MSS • Explore embedded technology designs to facilitate MSS Training	• Refine MSS training methods • Develop/validate additional tools to predict & assess training effectiveness of MSS • Develop job aides for refresher training & skill retention • Determine alternative training strategies to counter skill decay

Table 5. Mid-term and Long-term Research and Analysis Projects

At the level of the Army Leadership, the main study effort should revolve around making an overall assessment of the implementation efforts to date, with an eye toward making whatever changes or adjustments are required. At the same time, the entire realm of MSS sustainment should be reviewed for adequacy and completeness. This is also an opportune time to identify follow-on future study priorities for the period after the OF units start entering the force structure. This research may also provide the basis for translating the MSS Developmental Blueprint concepts into more detailed and refined procedures for supporting both the final stages of implementation and the initial stages sustainment.

CONCLUSIONS AND RECOMMENDATIONS

The U.S. Army's leadership intends to accelerate transformation efforts to field the OF. The notion of the multi-skilled soldier will serve as a crucial enabling concept in the human dimension for bringing the OF to full fruition. For these reasons, the conclusions and recommendations detailed below are particularly focused on where the Army is and where it should go relative to meaningful and timely MSS implementation.

Conclusions

1. **There is no official consensus or definition of the MSS relating to the requirements of the Objective Force.** There is general consensus among key participants that OF soldiers should be more adaptable and provide more skill depth and redundancy than present-day soldiers, thereby enabling units to operate with both increased capabilities and smaller operational footprints. However, there is no clear consensus with respect to more detailed aspects of the MSS concept; no authoritative working definition of the multi-skilled soldier, no layout of MSS expectations in OF requirements documents, no integrated implementation plan in place or under development; and no proponent clearly charged with developing one. In fact, the MSS Concept is much more complex and multi-dimensional than many seem aware. The MSS Concept has many associated notions. Varying characterizations abound, depending how one groups and prioritizes these various notions. Absent an approved concept, implementation planning will tend to remain unfocused and chaotic.

2. **There is no integrated planning underway for comprehensive MSS implementation.** There is no Army-wide proponent for MSS Concept development. However, implementing the MSS concept will require an iterative, step-by-step process in which concepts and plans are more clearly adjusted and refined at each successive stage. In this connection, effective and efficient MSS realization will require comprehensive, top-down integrating guidance and oversight across at least three major activity categories: personnel, training, and policy development. While there is a broad consensus that the MSS Concept is

an essential ingredient in the human dimension design of the OF, most of the efforts associated with the OF have thus far focused on operational concepts, materiel acquisition, and organizational design. However, MSS implementation is one of the longer poles in the tent in terms of preparatory time, effort, and resources for the OF.

3. **Most of the discussions about the MSS Concept have oriented on the needs of the Objective Force.** What are today termed the OF, the Interim Force, and the Legacy Force will co-exist for many years. The benefits of MSS implementation can probably be applied to increase skill depth and redundancy in Interim and Legacy Forces as well. Designing and implementing the MSS Concept for the entire Army, including the Reserve Components, is much more efficient and desirable than operating different training and personnel systems for the Interim and Legacy Forces. However, optimizing MSS realization for the entire force requires a conscious design focus from the very beginning of the implementation process.

4. **The MSS Concept involves issues of human cognitive potential and associated practices that have not been adequately researched for the peculiar requirements of the Objective Force.** In significant ways, MSS implementing involves navigating through uncharted waters relative to human cognition. The demands in the cognitive realm inherent in the MSS Concept involve crucial unresolved issues and unanswered questions that require a significant program of behavioral research relating to virtually every aspect of the life cycle of the soldier, to include: recruiting, classification, selection, distribution, deployment, retention, training and education, sustainment, professional development, and separation. Timely behavioral research can help ensure that the initial MSS designs are within the realm of sound cognitive expectations for the general soldier population. Such research can also suggest best practices for a number of important MSS-related activities (e.g., curriculum design, distance or distributed learning, motivation for perpetual learning, learning strategies for complex jobs, classification and selection, recruiting, retention, competency-based learning).

Recommendations

1. **The Army should expeditiously and authoritatively define the MSS Concept.** This is a necessary prerequisite to drive comprehensive planning for integrated concept implementation. The Army should ensure that the MSS requirements are fully reflected in OF documents.

2. **The Army should expeditiously establish overall proponency for MSS realization, select a corresponding course of action from among several candidates, and put an integrated master implementation and sustainment plan in place.** This master plan would encompass Departmental oversight and a comprehensive blending of efforts in the policy, personnel, and training realms to ensure unity of effort.

3. **The Army should structure MSS implementation and sustainment for optimal and parallel benefit of the Interim and Legacy Forces.** This means designing an MSS implementation and sustainment approach from the beginning that, insofar as possible, can be applied across the entire force, to include the Reserve Components.

4. **The Army should conduct the necessary research and analysis projects, inclusive of behavioral research, to implement the MSS Concept effectively and efficiently.** This includes laying a foundation for the required conceptual underpinnings, data, and systems required to establish and sustain a significantly altered approach for manning the force. Without such fundamental research, pursuing MSS could easily become a high-risk, trial-and-error, hit-or-miss venture.

Conclusions	Recommendations
There is no official consensus or definition of the MSS relating to the requirements of the Objective Force.	The Army should expeditiously and authoritatively define the MSS Concept.
There is no integrated planning underway for comprehensive MSS implementation.	The Army should expeditiously establish overall proponency for MSS realization, select a corresponding course of action from among several candidates, and put an integrated master implementation plan in place.
Most of the discussions about the MSS Concept have oriented on the needs of the Objective Force.	The Army should structure MSS implementation and sustainment for optimal and parallel benefit of the Interim and Legacy Forces.
The MSS Concept involves issues of human cognitive potential and associated practices that have not been adequately researched for the peculiar requirements of the Objective Force.	The Army should conduct the necessary research and analysis projects, inclusive of behavioral research, to implement the MSS Concept effectively and efficiently.

Table 6. Conclusions and Recommendations

The Immediate Way Ahead

In light of these conclusions and recommendations, the following steps are the most important and pressing for the immediate future if the MSS Concept is to be implemented by 2008. These steps are reflected in the MSS Roadmap and Table 7:

1. **Define the MSS Concept authoritatively and empower an overall proponent**. This includes envisioning and articulating the desired end state sought from MSS

implementation, relative to the OF and the Army as a whole (to include maneuver support and maneuver sustainment elements, as well as the Reserve Components). This end state should be translated into future force requirements documents.

2. **Develop MSS implementation and sustainment courses of action for decision.** Led by the proponent, these courses of action would consider viable and feasible options that address primarily the extent, phasing, and costs of MSS implementation and sustainment. This step would end with a decision by the Army Leadership on which course of action, if any, to pursue, as well as any guidance for further plan development.

3. **Develop an MSS Master Implementation and Sustainment Plan.** This is the integrated and comprehensive plan to execute the course of action selected.

4. **Put a "wedge" in the Army POM to support MSS implementation before 2008 and to support MSS sustainment after 2008.** The amount of the wedge would reflect the cost estimates associated with the range of courses of action under consideration.

5. **Commence "foundation" behavioral and training studies.** The recommended studies are listed in order of priority in the MSS Study Plan.

6. **Develop Unit of Action prototypes.** This involves working closely with TRADOC to identify potential skill combinations for the MSS that best meet the operational needs of the Unit of Action and that would also enhance the capabilities of the Legacy and Interim Forces. These "prototypes" would then serve as a model against which assess the feasibility and desirability of such skill combinations and to explore alternate combinations.

7. **Develop an MSS skill database**. The current task-based Army training methodology must be adapted for a skill-focused, competency-based one. The database to support this shift does not currently exist and must be constructed.

8. **Proceed with supporting MOS consolidation**. MOS consolidation is a necessary prerequisite for MSS implementation. However, it must be done with an eye toward anticipated skill combinations envisioned for the MSS. Otherwise, MOS consolidation could, as an unintended consequence, be carried out in a way to impede the skill combinations desired for MSS implementation. For this reason, MOS consolidation efforts must be synchronized with both the aforementioned MSS concept definition and Unit of Action prototyping.

9. **Tailor the MOCS Process for MSS**. The purpose of this step is to identify ways to accelerate and expedite the MOCS process for documenting and implementing changes to MOS, as well as for supporting the specific needs of the MSS. Current process timelines and procedures do not support making the kind of rapid

personnel system changes required to support MSS realization by 2008, particularly regarding MOS consolidations.

The Immediate Way Ahead
• Define the MSS Concept authoritatively and empower an overall proponent. • Develop MSS implementation and sustainment courses of action for decision. • Develop an MSS Master Implementation and Sustainment Plan. • Put a "wedge" in the Army POM to support MSS implementation before 2008 and to support MSS sustainment after 2008. • Commence "foundation" behavioral and training studies. • Develop Unit of Action prototypes. • Develop an MSS skill database. • Proceed with synchronized MOS consolidation. • Tailor the MOCS Process for MSS.

Table 7. The Immediate Way Ahead.

REFERENCES

Akman, Allan (1998). Task knowledges commonality analysis method (TKCAM) user's manual. Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences.

Department of the Army. (1997). The Army personnel proponent system (Department of the Army Regulation 600-3). [On Line]. Available: http://www.usapa.army.mil/gils/epubs//.html

Department of the Army. (2001). Concepts for the Objective Force (United States Army White Paper). [On-line]. Available: http://www.army.mil.

Department of the Army. (2001). Enlisted personnel management system XXI: Final Report. (Report prepared for the Chief of Staff, Army, by the Army Development System XXI Task Force). Alexandria, VA: ADS-XXI Task Force.

Department of the Army (1999). Military occupational classification and structure (Department of the Army Pamphlet 611-21). [On Line]. Available: http://www.usapa.army.mil/gils/epubs//.html

Department of the Navy. (1999). Sailor 21: A research vision to attract, retain, and utilize the 21st century sailor. [On line]. Available: http://www.nprdc.navy.mil/sailor21.htm.

Employment and Training Administration (ETA), U.S. Department of Labor (1999). O*NET 98 data dictionary. Washington, D.C., Department of Labor.

Ford, Laura A., Campbell, Roy C., Knapp, Deirdre J., and Walker, Clinton B. (2000). 21st century soldiers and noncommissioned officers: Critical predictors of performance (ARI Technical Report 1102). Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences.

U.S. Army Training and Doctrine Command (TRADOC) (1999). Systems approach to training [SAT] management, processes, and products (TRADOC Regulation 350-70). [On-line]. Available: http://www-dcst.monroe.army.mil/tdaa/SAT/tr_350-701.htm.

U.S. Army Training and Doctrine Command (TRADOC) (1999). Requirements determination (TRADOC Pamphlet 71-9). [On-line]. Available: http://tradoc.monroe.army.mil/tpubs/pams/p71-9/1999/p71-9.html.

Appendix A – List of Abbreviations and Acronyms

ADS-XXI TF	Army Development System-XXI Task Force
AIT	Advanced Individual Training
ANCOC	Advanced Non-Commissioned Officer Course
AOT	Assignment-Oriented Training
ASI	Additional Skill Identifiers
AST	Additional Skills Training
AVT	Advanced Training
BCT	Basic Combat Training
BNCOC	Basic Non-Commissioned Officer Course
CMF	Career Management Field
COTS	Commercial Off-the-Shelf Technology
DA	Department of the Army
DL	Distance Learning
DT	Distributed Training
HQDA	Headquarters, Department of the Army
IBCT	Interim Brigade Combat Teams
KSA	Knowledges, Skills, and Abilities
MACOM	Major Command
MOS	Military Occupational Specialty(-ies)
MOCS	Military Occupation Classification Structure
MOE	Measures of Effectiveness
MSS	Multi-Skilled Soldier
NCO	Non-Commissioned Officer
OF	Objective Force
OFTF	Objective Force Task Force
PERSCOM	U.S. Army Total Personnel Command
PLDC	Primary Leadership Development Course
RC	Reserve Component(s)
SAT	Systems Approach to Training
SD	Self-Development
SI	Skill Identifier
SL	Skill Level
SMOS	Secondary Military Occupational Specialty
SQI	Special Qualification Identifier
TKCAM	Task Knowledges Commonality Analysis Method
TMDE	Test and Measurement Devices and Equipment
TOE	Table(s) of Organization & Equipment
TRADOC	U.S. Army Training and Doctrine Command
TTHS	Trainees, Transients, Holdees, and Students Account
UOA	Unit of Action
UST	Unit-Specific Training
WT	Warrior Training

Project Description	
Title	**Case Study: Prototype MSS for the Objective Force Unit of Action**
Purpose	To develop MSS concepts based on a unit of action of the Objective Force.
Description (Statement of Work)	There is need to further develop and refine MSS concepts so that they more closely mirror operational realities. This project will develop MSS concepts keyed to a specification of a unit of action (formal doctrine, if available; otherwise, best speculation) that may exist in the Objective Force. Based on a definition of the unit of action and its functional requirements, examples of MSS will be formulated. These examples will be used to refine concepts and issues that must be addressed by the Army as its transforms to MSS. To facilitate this effort, MOS data identifying common knowledge requirements among MOS developed previously by ARI (Future MOS Consolidation Project, 2000) will be used as a point of departure. This project should: • Develop concepts of a typical unit of action of the Objective Force, its functional requirements, and its soldier requirements. • For a set of functional requirements, identify examples of MSS that may be required by the unit of action. • Develop descriptive data required for MSS implementation and management.
Products/ Results	• A description of a typical unit of action of the Objective Force along with examples of its MSS requirements. • A prototype database of characteristics for selected MSS.

Project Description	
Title	**Prototype MSS Skill Database**
Purpose	To develop a prototype database of skill requirements of selected MOS.
Description (Statement of Work)	While the focus of current efforts is on MSS, MOS databases have to date primarily concentrated on task-level data. As the Army considers adopting MSS concepts as well as competency-based training, there potentially is need for skill data. These type data are virtually non-existent for MOS. In October 2000, knowledge data were developed for eight MOS. This effort should develop skill data for these same MOS to create a prototype MSS database that could be used where data are needed to develop, refine, and test MSS concepts. This project should: • Develop a MSS skill taxonomy that can be used to support MOS restructuring and training re-design and development. • Formulate methods for collecting MOS-based skill data. • Collect skill data for selected MOS. • Organize skill data along with other MOS data into a prototype MSS database. • Develop examples of how the data may be used to address MSS development and implementation issues. • Develop examples of how the data may be used to address MSS training issues.
Products/ Results	• An MSS skill taxonomy • A method for collecting skill data for MOS. • A prototype MSS database including knowledge and skill data that could be used in developing, implementing, and managing MSS as well as addressing MSS training issues.

Project Description	
Title	**MOS Consolidation**
Purpose	To assess the feasibility of MOS consolidation as a baseline for MSS development.
Description (Statement of Work)	The ADS XXI Task Force identified various combinations of MOS that should be considered for consolidation. TKCAM can be used to assess the feasibility of these potential MOS combinations. Assessing the feasibility of MOS consolidation can support the development of the MSS in several ways. By establishing the feasibility of selected MOS combinations, a baseline can be established for considering multi-skilling. Feasible MOS combinations may be used to identify priorities in terms of groups of MOS that may be multi-skilled, potentially reducing risk and disruption related to MSS development. Data developed in this project, particularly those identifying MOS commonalities, may support the Army's consideration of centers of excellence as an organizing principle versus the present branch-centric approach. The data may be useful in identifying and selecting segments of current MOS that may be incorporated into multi-skilled MOS. Finally, the data developed in this assessment may be used to support training planning for multi-skilled soldiers by identifying commonalities among MOS that may be trained. This project should: • Identify feasible MOS combinations based on commonality of knowledge requirements. • Develop an MOS knowledge database that can support development of MSS.
Products/ Results	• Enumeration of feasible MOS combinations based on knowledge requirements. • MOS knowledge database.

Project Description	
Title	**MSS Military Occupational Classification and Structure (MOCS) Process**
Purpose	To identify ways to accelerate and expedite the MOCS process to meet MSS timelines and requirements.
Description (Statement of Work)	The Army G-1's MOCS process is a defined procedure for documenting and implementing change to MOS. The Army's transformation to MSS ultimately will be accomplished through this process. The ADS XXI Task Force reviewed the current MOCS process. There have been other reviews of the Army's procedures and those of other military services. The requirements for implementing MSS as part of the Objective Force involves timelines that are likely shorter than current MOCS procedures require. This effort is aimed at reviewing current personnel procedures and determining ways in which they maybe streamlined in order to meet the timelines for the Objective Force. This project should: • Review past studies of job structuring procedures of the Army and other military services to identify lessons learned. • Document the current MOCS procedures. • Identify ways in which the MOCS process can be expedited and the effects and resource implications of such procedural changes. • Describe a modified MOCS process tailored to meet the needs of MSS development and implementation.
Products/ Results	• Recommended MSS MOCS process for development and documentation of restructured MSS MOS.

Project Description	
Title	**Determine the Applicability of the MSS Construct to the Legacy and Interim Forces**
Purpose	To assess the applicability of the MSS Concept not only to the emerging Objective Force, but also to the Legacy and Interim Forces.
Description (Statement of Work)	Most discussions about the MSS are made in the context of supporting the operational concepts of the emerging Objective Force. Yet, what is today termed the Legacy and Interim Forces will coexist with the Objective Force at least until 2020 by current projections. Implementing the MSS for only the Objective Force would reinforce the perception of at least three different armies with the Army, and would lead to duplicative personnel and training systems that significantly increase organizational and bureaucratic overhead in a way that inhibits a fully efficient employment of available resources. This study should: • Assess the coincident applicability of the MSS Concept to the Legacy and Interim Forces • Identify & access a range of prioritized strategies for applying the MSS Concept to the Legacy & Interim Forces coincident with its implementation for the Objective Force • Study the advantages & limitations of doing so. • Assess the full implications of not applying the MSS Concept to the Legacy & Interim Forces
Products/ Results	• An analysis of the most feasible courses of action for retrofit of the MSS to the Legacy & Interim Forces. • Recommended methodologies to overcome the chief obstacles and employ the key enablers in facilitating application of the MSS Concept to the Legacy & Interim Forces. • "Best practices" for applying the MSS Concept to the Legacy & interim Forces.

Project Description	
Title	**Determine Impacts of MSS on the Army's Reserve Components (RC)**
Purpose	To assess the applicability of the MSS Concept to the US Army National Guard and to the US Army Reserve
Description (Statement of Work)	Discussions of the MSS Concept focus predominantly on the Objective Force, most of which will be in the Active Component, at least initially. The desire to uphold the notion of the Total Force would argue ideally for implementation of such a basic Concept as the MSS as uniformly as possible across the entire Force so as to avoid the perception of a hierarchy in quality of forces and to promote optimal efficiencies in training and personnel management. This study should: • Explore the applicability of the MSS Concept to the various elements of the Army's Reserve Components. • Identify key obstacles and enablers to such applicability • Assess the downside of not attempting to implement the MSS Concept, where possible, throughout the RC.
Products/ Results	• An overall assessment of the applicability of the MSS Concept to the Army's Reserve Components • An analysis of strategies and implementing courses of action to apply the MSS Concept to the RC • Recommended approaches to overcome salient obstacles and to utilize enablers fully in the above-referenced courses of action. • Best practices and principles for applying the MSS Concept to the RC.

Project Description	
Title	**Determine Performance and Cognitive Limits on MSS**
Purpose	To identify performance and cognitive limits on MSS and strategies that may offset the limitations.
Description (Statement of Work)	Underlying efforts to create multi-skilled soldiers is the goal to create soldiers who provide their units of action with adaptability, flexibility, and redundancy. Implicit is the expectation that soldiers will perform in more demanding ways. As MOS are transformed to multi-skilled MOS, consideration of performance and cognitive limits appears critical in order that new MOS predicated on unrealistic requirements are not created. This project should: • Identify both performance and cognitive limits on MSS and describe them in ways that can be used by personnel analysts to formulate specific MSS MOS. • Determine tradeoff strategies for each limitation that can be considered as a means to offset or lessen the constraining effects of the various performance and cognitive limitations. • Demonstrate the applicability of the definitions and tradeoff strategies for a typical or prototype MSS.
Products/ Results	• A taxonomy of performance and cognitive limits with corresponding descriptions and examples. • A description of tradeoff strategies that can be used by personnel planners to limit the effects of such limitations. • An example of the application of recommended tradeoff strategies.

Project Description	
Title	**Develop Principles for Identifying and Categorizing Jobs Requiring Multi-Skilling**
Purpose	To develop principles for identifying and categorizing jobs requiring multi-skilling.
Description (Statement of Work)	The MSS Developmental Blueprint lays out a process by which requirements for MSS soldiers can be defined based on the requirements associated with multi-functional units. The Blueprint incorporates various assessment steps including linking functions, duties and jobs, soldier requirements and attributes assessments, and tradeoff/constraint methodologies. This project aims to identify the principles and formulate methods by which the Blueprint's assessment steps can be accomplished. This project should: • Develop a set of principles for identifying and categorizing jobs requiring multi-skilling. • Develop assessment methods that apply these principles in the context of the Developmental Blueprint facilitating the definition of jobs as functions of the requirements of multi-functional units, comparisons and assessments of soldier requirements and attributes, and formulation of tradeoff/constraint methodologies.
Products/ Results	• A method for defining multi-skilled jobs as functions of the requirements of multi-functional units. • A method for matching soldier job requirements and soldier attributes. • A method for addressing tradeoffs and constraints affecting the development of MSS. • Demonstration of the application of the various methods illustrating the use of the MSS Developmental Blueprint for identifying and categorizing jobs requiring multi-skilling.

Project Description	
Title	**Determine Implications Between Task-Based and Competency-Based Approaches to Job Structuring and Learning**
Purpose	To determine the differences and associated implications for the MSS between task-based and competency-based approaches to job structuring and learning.
Description (Statement of Work)	Much of current Army personnel and training planning is task-based. In the course of adopting the MSS concept, serious consideration is being given to placing a greater emphasis on a competency-based approach. In the latter case, more attention would be placed on knowledges, skills, abilities, and other task performance enablers when designing jobs and carrying out training. This project is aimed at identifying the implications stemming from a competency-based approach. This project should: • Develop an operational concept for a competency-based approach to job structuring and training. • Characterize and contrast a competency-based approach with the current task-based approach. • Address the advantages and limitations of a competency-based approach. • Formulate a recommended strategy to be followed in adopting a competency-based approach.
Products/ Results	• An assessment of the implications of adopting a competency-based approach to job structuring and learning. • Recommendations and a conceptual plan of action for adopting a competency-based training and learning approach for the MSS.

Project Description	
Title	**Identify KSAs Associated with Effective Performance of Tasks in an MSS Environment**
Purpose	To identify KSAs associated with effective performance of tasks in an MSS environment.
Description (Statement of Work)	KSAs enable task performance. As jobs are restructured to create MSS, combinations of existing jobs that have substantial commonality among KSAs will potentially prove more successful. This aim of this project is to identify sets of knowledges, skills, and abilities that, when combined, facilitate task performance. Sets of knowledges can be identified from existing TKCAM databases. Skill and ability sets can be derived using TKCAM-like procedures. This project should: • Develop TKCAM-like or other procedures for identifying skill and ability sets. • Collect skill and ability data corresponding to knowledge data for selected MOS. • Identify relationships between KSAs and task performance. • Organize the data in a prototype database that can be used to support MSS development.
Products/ Results	• Review of research literature documenting how KSAs relate to task performance. • Descriptions of methods for acquiring task-based knowledge, skill, and ability data. • KSA sets contributing to effective task performance. • Prototype KSA database.

Project Description	
Title	**Determine Mitigating Approaches to Lessen the Impact of Skill Decay on MSS Performance**
Purpose	To identify variables that predict the difficulty of acquiring and maintaining skills of the type required of the MSS and to identify mitigating approaches for skill decay
Description (Statement of Work)	The variables determining skill acquisition and decay fall into three broad classes: individual attributes, occupational-organizational variables, and the nature of the skill itself. Intelligence and motivation are two broad variables of the individual class, number of tasks in an occupation and opportunity for practice of a skill are two broad variables of the second class, and physical coordination and mathematical skills are two broad variables of the third class. This project should: • Identify the individual differences variables that a) most influence skill acquisition and maintenance, and b) are most susceptible to change through organizational intervention (e.g., rewards, types of training, etc.) • Identify the attributes or typologies that most efficiently predict the difficulty of acquiring and maintaining skills • Test a methodology for applying the knowledge of these variables to predicting the difficulty of specific skill acquisition and maintenance scenarios.
Products/ Results	• Taxonomies of attributes for individual, occupational, organizational, and skill variables affecting skill acquisition and decay, or typologies of the same variable sets • Description of a methodology (or methodologies) to predict the difficulty for the MSS in learning and maintaining acceptable levels of skill • Design and conduct of studies to test the validity of the method(s) on existing MOS • Derive principles and approaches for "best methods" to design initial and sustaining training curricula for MSS in order to mitigate skill decay.

Project Description	
Title	**Determine How Recruiting Pool Demographics (2005-2010) Potentially Impact MSS**
Purpose	To determine how recruiting pool demographics (2005-2010) relate to MSS.
Description (Statement of Work)	The pool of people from which the Army recruits its soldiers has certain demographic characteristics. Both the Army's personnel requirements and recruiting must be consistent with those characteristics. This is so for the MSS. To the extent characteristics of the MSS differ from that of current soldiers, there will be new requirements. The pool from which the Army will recruit for the initial MSS already is in place. Requirements for MSS must be consistent with the attributes recruits are likely to have. This project should: • Project the demographic characteristics for the recruiting pool in the 2005-2010 timeframe. • Identify the constraints that the projected demographic characteristics may impose on the MSS requirements.
Products/ Results	• Enumeration of recruiting pool demographics (2005-2010) and identification of potential recruiting enablers and limitations. • Description of demographic constraints on MSS design. • Procedures for maintaining and monitoring recruiting pool demographics in support of MSS.

Project Description	
Title	**Determine "Best Practice" Methods for Designing Curriculum and Learning Strategies for Complex Jobs**
Purpose	To review and evaluate methods and systems for designing curricula incorporating appropriate learning strategies for the MOS structure of the MSS.
Description (Statement of Work)	Considerable expertise exists in the Army for designing curricula and learning experiences for highly technical occupations, largely using task-based learning and measurement strategies. The MSS will involve fewer, broader, more complex MOS with a greater emphasis on "competency-based" than on specific task competence. Also, much of MSS success is dependent upon broadening and deepening skill set proficiency outside of residential training courses. This project should: • Collect and document existing Army expertise on curricula development and learning strategies for teaching the broader, more complex MOS and for continued, self-motivated, individual learning • Review and evaluate civilian educational literature for pertinent knowledge for the same issues • Create and assess two or more prototype, curriculum design systems that incorporate the "best practices" from the Army and civilian literatures.
Products/ Results	• Identification of "best practices" and "major pitfalls" for curricula design and learning strategies in support of MSS • A similar evaluation of current civilian (and other services) educational practices to detect potential "best practices" and "pitfalls" • Plan for follow-on performance testing of prototypes on new, broader MOS using Army training personnel

Project Description	
Title	**Determine the "Best Practice" Approaches for Integrating Distance Learning (DL) into the Training & Educational Design of the MSS**
Purpose	To assess the use of current and anticipated DL technologies to support an optimal design for an effective and efficient training, educational, and learning process across the career of the MSS.
Description (Statement of Work)	In recent years, the use of personal computer-based and Internet-based technology has profoundly expanded. This technology holds great promise for multiplying the effectiveness of training in at least three ways: accessibility, flexibility, and fidelity. A phone line and a PC provide easy access to potentially sophisticated training content that can be dynamically altered fairly quickly, and, through use of DVD video contain large amounts of high-fidelity representations of job situations. This project should: • Critically review the literature on the use of DL from the point of view of optimal incorporation into the entire MSS training & education scheme. Identify the types of skill proficiencies most likely and least likely to be assisted by DL. • Identify the likely enablers and barriers for DL support to the MSS
Products/ Results	• Identification of the most likely enablers for, and obstacles to, best DL use in support MSS. • Overall assessment of DL' s potential for career-long support to the MSS, to include "best practice" guidelines for MSS support. • Specific findings & recommendations on DL support for task, skill, and "competency-based training," to support the MSS Concept. • Organizational & resource considerations for DL applications to support the MSS, with estimates of costs and expected benefits of DL use over more traditional approaches.

Project Description	
Title	**Determine Best Methodologies to Motivate and Facilitate the Perpetually Learning, Multi-Skilled Soldier**
Purpose	To assess the best methodologies for motivating the MSS to deepen & broaden skill sets through individual efforts after initial training and to facilitate soldier efforts to do so.
Description (Statement of Work)	Pivotal to the MSS Concept is the notion of the perpetually learning soldier. Such soldiers would be positively motivated to deepen and broaden their skill set knowledges and proficiencies through largely individual study efforts following initial entry training. How to nurture and facilitate the individual soldier in doing so is the focus of this study. This project should: • Assess approaches that would successfully motivate and orient soldiers to the perpetually learning model and provide them with a sufficiently effective educational foundation during initial training to sustain future efforts in that regard. • Assess post-initial training approaches and techniques that would reinforce soldier motivation. • Identify and analyze the more salient impediments and limitations to molding the perpetually learning soldier. • Explore the most effective positive and negative incentives. • Explore the role of the junior leader in sustaining and reinforcing perpetually learning soldiers
Products/ Results	• "Best practices" and pitfalls in motivating and encouraging soldiers both during initial training and afterward. • Strategies to overcome identified impediments. • Assessment of realistic motivational limitations • Guidelines for the application of career "carrots and sticks" • Analysis of the role of the junior leader (NCO & Officer) in motivating, encouraging, & facilitating.