



Special Report 53
November 2002

Training for Future Operations: Digital Leaders' Transformation Insights

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FOREWORD

In the Army's Transformation to the Objective Force lies the key to success in the Future Operational Environment. Objective Force training must produce leaders who are innovative, creative risk-takers. The leaders must guide units that are more deployable, agile, versatile, lethal, survivable, and sustainable. They must harness dramatically new doctrine, organization, and materiel. In the midst of sweeping change, the Army must now move aggressively to develop high-payoff training and leader development programs for the Objective Force.

This report mines the wealth of knowledge hard won by early Transformation leaders. Those leaders — the Army's digital experts — learned invaluable lessons in the First Digital Division and the Stryker Brigade Combat Team. In the Army tradition of learning from experience, the leaders have shared their insights and lessons about training in the Transformation environment. The insights and lessons come from hands-on use of digital systems by real soldiers in tough “in the dirt” training events. By capturing and sharing this knowledge, the U.S. Army Research Institute continues its long-standing commitment to excellence in Army training.

The intent of this report is to disseminate invaluable training lessons so they can benefit the future force. By applying the lessons and recommendations, Transformation leaders working in tactical units, schoolhouses, and Army agencies can achieve a decisive training advantage.

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CHAPTER 1 - INTRODUCTION

The Digital Training Challenge of the Future

The United States Army White Paper, *Concepts for the Objective Force*,¹ describes soldiers who are “highly trained in all tasks across the spectrum of military operations.” Leaders “must be capable of training their units without significant external support packages and will need to be innovative, creative risk-takers in both training and in warfighting.” The training must enable the Objective Force to be more deployable, agile, versatile, lethal, survivable, and sustainable. The Army now faces the challenge of how to develop the infrastructure and programs to accomplish the full spectrum training and leader development associated with the Objective Force.

As seen in Table 1, Objective Force characteristics will differ noticeably from the current force. Leaders will be educated for more rapid decision making and team building. This means changing from plan-centric to intent-centric operations, from physical to virtual rehearsals, and from static Command Posts (CP) to command and control on the move.¹ Soldiers will be required to be multi-capable, adaptive, and self-aware – knowing how to clear a room, send a digital message, or repair a vehicle.

As the Army considers the training required to prepare the future force, insights of leaders, who transformed analog units into digital units, can point out potential problems and suggest possible solutions to the challenges ahead. Simply stated – the Army has an opportunity to learn from its recent history in order to stay abreast of the sweeping force and equipment changes envisioned.

The U.S. Army Research Institute’s (ARI) transformation-focused project, *Managing at the Speed of Change in Force XXI* (MASC-XXI), captured digital leaders’ hard-won knowledge to make it available for others to use. The purpose of this report is to share leader insights from the MASC-XXI project that can bolster training in the future force.

Table 1. Objective Versus Current Force Characteristics

Dimension	Characteristics	
	Current	Objective Force
Unit Context	Proximate, centralized	Isolated, decentralized
Command Posts	Stationary	Mobile
Planning Process	Echeloned, sequential	Collaborative, parallel
Decision-Making	Plan-centric, fast-paced	Intent-centric, accelerated
Rehearsals	Physical	Virtual
Weapons	Crewed, smart	Crewed, intelligent, robotic
Team Membership	Joint, coalition, stable	Joint, coalition, flexible
Leader Skills	Competent, specialized	Multi-functional, adaptive, self-aware
Soldier Skills	Competent, specialized	Multi-skilled, adaptable learners, self-aware

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The MASC-XXI Project

The MASC-XXI project gathered insights and lessons learned from leaders participating in the digital transformation. The MASC-XXI team interviewed division leaders and brigade commanders within the 4th Infantry Division (4ID, aka First Digital Division [FDD]), both early and late in their tour of duty overlapping the Division Capstone Exercise.

For this training-focused report the team conducted additional interviews with one former brigade commander (who had participated in two earlier interviews) and the I Corps Deputy Commanding General for Training and Readiness, who had previously commanded a brigade in the 4ID. The combined set of interviews yielded insights and lessons about training in both the FDD at Fort Hood, Texas, and the Interim Brigade Combat Team (now the Stryker Brigade Combat Team [SBCT]) at Fort Lewis, Washington. In addition, two retired General Officers with digital experience contributed their own insights after reviewing the complete set of interview transcripts.

This report, the final product from the MASC-XXI project, presents the most salient information garnered from the effort and points the way toward training successfully in a change-driven environment while fielding the Future Combat System (FCS) and the Objective Force. Earlier products include a preliminary Web-based Leader's Tool and a Study Report.² The Leader's Tool is available at Fort Hood's Battle Command Training Center (BCTC) to help leaders in III Corps as they tackle digital transformation challenges similar to those faced by their predecessors. Others can visit the BCTC web page at <http://bctc.hood.army.mil> to arrange for access to the Leader's Tool. The original interview transcriptions are available in the Leader's Tool.

CHAPTER 2 - DIGITAL LEADER INSIGHTS

The authors of this chapter have been continuously involved in the MASC-XXI project from the beginning. They reviewed the transcripts accumulated during the project to identify future training and leader development impacts. See Annex 1 for a complete list of all 12 interviews.

The insights and conclusions stemming directly from the interviews with digital leaders were documented and organized by the authors in the following sections:

- ◆ Training Environment and Enablers
- ◆ Training Fundamentals
- ◆ Team-Focused Training
- ◆ Battle Lab Role in Transformation.



Training Environment and Enablers

Training Doctrine

Leaders interviewed felt that the Army's training doctrine as captured in FM 25-100³ and FM 25-101⁴ is basically sound. The doctrine focuses units on what is key for training. What is the mission? What are the battle tasks? What is in the Mission Essential Task List (METL)? Quarterly Training Briefs bring leadership into the program to align resources with requirements. Training meetings facilitate identification of events and planning for them. (Authors' note: The training doctrine manuals, FM 25-100 and FM 25-101, are in rewrite status as FM 7.0 and 7.1.)

The leaders also noted that the execution of the doctrine leaves room for improvement. Units have difficulty protecting training time. Training schedules are not locked. There seems to be more reaction and last-minute adjustment than execution of training as planned. This may be due to the current environment. Consider that in January of 2002, the 10th Mountain Division had a brigade in Kosovo, a battalion/task force in the Sinai, a battalion/task force in Bosnia, and a battalion plus in Uzbekistan. Very few of the missions and tasks these units are doing would fit into the traditional METL of units in the Cold War era. Missions now focus on peacekeeping, peace support, and security type operations. This environment resembles the environment projected for the Objective Force.

It is the authors' observation that because of the Army's multiple and varied missions and the expectation that the future will bring more of the same, the training doctrine manuals need to be adjusted for the expected environment.

Expanded Training Requirements

"I am amazed that anyone would say that there is no additional training requirement [in a digital unit]."

COL Bob Cone, 6 Dec 01

The 4ID's experience in going from an analog to a digital division clearly indicates that digitization added to the unit's already considerable training burden. The 4ID viewed digitization as a tool to enable the warfighter to be more successful. However, if an individual soldier lacked basic warfighting skills, digitization did not correct that deficiency because basic warfighting skills were a prerequisite for successful digital training. The unit's model called for training the basic warfighting skills and then following with digital training. This model has been referred to as additive training.

Regarding staffs, the 4ID found that a reasonably competent staff was not sufficient. Staff soldiers had to be experts at how their systems worked. Digitization required a highly competent staff that could use the systems to update the commander's intent and get units to the right place at the right time. The staffs shifted from determining where the enemy was to determining what the enemy was going to do. This required more repetitive staff training than the 4ID was accustomed to.

Leaders indicated that to get to a highly competent staff also required that operators – in dyads and triads – and the staff as a whole be trained in their individual “stovepipe” systems and also trained in other systems. The coordination and synchronization across all the digital systems fully leverages the capabilities inherent in digital operations.

The progression followed by the 4ID was in part caused by the unit having to develop much of its own training. Most of the leaders believed that in the spiral development environment, there simply was no agency available or knowledgeable enough to develop training and then support the 4ID as it conducted the training.

The 4ID literally determined what right looked like, documented it as best they could, and then trained themselves. It should be no surprise that people who experienced the analog to digital transformation in the 4ID have strong feelings about the additive training burden of digitization.

The authors concluded that digital proficiency requirements add to the existing training burden and that additional resources are required to develop and execute training in units, in institutions, and through self-development.

Digital Training Strategy – a Paradigm Shift

“The Army has wrestled with the digital training concept for six or seven years. ... And yet, there is no funded digital training strategy.”

BG Tom Goedkoop, 8 Jan 02

Only recently has the Training and Doctrine Command (TRADOC) developed a formal digital training strategy.⁵ It would be inaccurate to say, however, that there was no digital training strategy previously. Training strategies did evolve informally. Fort Hood and Fort Lewis have created organizations that are developing training to remedy their digital training shortfalls. At Fort Hood, the Central Technical Support Facility was the home of all operator digital training for several years. Warrior-T is now the center for digital job and task analysis. Additionally, the BCTC has been created to develop and conduct digital training. At Fort Lewis the Mission Support Training Facility (MSTF) and the Digital University have been established to support digital training in the SBCT. Fort Hood's BCTC and Warrior-T and Fort Lewis's MSTF and

Digital University are doing the front-end analysis, design, development, evaluation, feedback, and revisions associated with training development. These training development and execution efforts were largely done with funds from Army Transformation, Army Battle Command System (ABCS) Program Managers, and Unit Mission accounts rather than with TRADOC funds.

Though TRADOC Schools have participated sporadically in digital training, the transfer of training development functions to units and installations has occurred largely because the schoolhouses today do not have the personnel, equipment, or expertise to develop and train the digital skills. Traditionally, the schoolhouses were staffed with bright officers and Non-Commissioned Officers (NCOs) who had time to think about and develop future doctrine and training. Reductions in force structure eliminated the intellectual underpinnings from TRADOC schools. This has shifted most of the burden to the units undergoing transformation because the cutting edge technology and expertise were all in the field. The technology moved very fast. The TRADOC schoolhouses supported as best they could with their limited capabilities. However, Fort Hood and Fort Lewis had to develop the capability to train soldiers to stay abreast of the technology. Unfortunately, you can only put so much on the plate of an installation or unit.

The seemingly obvious solution is to integrate the multiple training development and execution efforts at various installations, to include TRADOC schools, into a coordinated and integrated effort in one organization. This organization has to be created, resourced, and given the authority to command and control the overall training efforts. Most importantly, it must anticipate the spiral development process and provide products before the units need them, not follow behind the units in the process.

The authors observed that the installations at which the digital units reside have become the focus of training development. Unfortunately, the installations do not have the doctrinal and training support structures necessary to replace the lost capabilities of the TRADOC schools. For future modernization, the Army needs an organization to command and control the entire training effort – across all battlefield functional areas.

Unit Training – the Budget Disconnect

The authors found that because training strategies evolved informally, training requirements lack linkage to the budgeting and programming processes. The III Corps program and budget structure has habitually omitted lines for training development. The same is true of I Corps at Fort Lewis. Additionally, these organizations have limited experience with determining the resources needed to develop and execute digital training. They are working through the challenges and are pursuing funding to support their efforts through the programming process for 2003. The quandary the Army faces is that the installations have the people with the expertise to develop and execute the training, but TRADOC has the associated funding stream. The solution seems simple: identify the costs, get them in the program, and provide the resources to the organization tasked to develop and support the training. The process and inherent hurdles, though not simple, need to be attacked now to be in place for the FCS and Objective Force. (Authors' note: *The Army Digital Training Strategy* awaiting publication partially addresses this issue.)

The authors believe that it is also imperative that future budgets provide adequate funding for the training needed. If the required program costs \$20M, you simply cannot make do with \$2M. Such severe constraints force decisions to zero out essential activities that happen to be lower

priority. The end result is that the pieces do not fit together and the training does not produce the proficiency required.

“It’s time to bite the bullet and resource the development of the full training requirements.”⁶

Personnel System Impact on Training

“The most critical thing I do as Division Commander is manage people – making sure the right person is in the right job.”

MG Ben Griffin, 3 May 00

The most often cited issue regarding the personnel system was the stabilization of personnel for the major events of both the Experimental Force (EXFOR) and the SBCT. The 4ID stabilized over 1,400 people for about a year for its Division Capstone Exercise. Because their skills and knowledge were critical to the successful performance of the unit, soldiers were stabilized six to nine months prior to the event to make sure they received sufficient individual and collective training. Then they remained in the 4ID three to four months after the event. For this and other major events, the actual length of time that the soldiers were stabilized was about a year. Clearly this had a significant impact.

To get the most out of an organization, the same people must participate in the preparatory exercises – for all the learning that takes place in each and all the corrections that take place in between. “In the absence of that, you keep relearning the same lessons over and over again with a different team of people.”⁷

A major issue with the stabilization experienced by the EXFOR and the SBCT units was that once the major forcing function (Advanced Warfighting Experiment [AWE], Limited User Test [LUT], etc.) ended, the entire team departed. When the replacements arrived, they had to be trained and melded into a team that then went through its own training to become proficient as a unit.

Another area of concern raised by the leaders was the failure to capitalize on the personnel who departed the 4ID. These people were desperately needed in the TRADOC schools and at the National Training Center (NTC) at Fort Irwin. They could have made a difference by passing on their knowledge to students at the schoolhouses or leaders at the NTC.

Contrary to normal personnel procedures, units stabilized their organizations and teams for major events to prevent the need to retrain repeatedly. Leaders universally noted that the personnel system could provide substantial benefit to the Army’s Transformation by modifying its policies and procedures.

Emerging Train-Alert-Deploy Cycle

“We don’t have time to train after we are given a mission that requires immediate deployment. This means that we have to be prepared, which means we have to be trained.”

BG Tom Goedkoop, 8 Jan 02

The Army faces a full spectrum of operations. Army units are being called upon to perform many missions in multiple places around the world on very short notice. The Army’s traditional METL

concept was designed to reduce a unit's training load to a relatively small set of critical tasks that would permit adequate training to maintain proficiency on those tasks. Today, units face an ever-expanding set of essential tasks. They cannot concentrate on a few tasks and they must be continuously prepared to deploy.

As mentioned earlier, in January 2002 the 10th Mountain Division had units in Kosovo, the Sinai, Bosnia, and Uzbekistan. Their missions included peacekeeping, peace support, and security operations. The 10th Mountain is probably no different from other divisions. This reality, coupled with the requirement for the SBCT to deploy within 96 hours, will make the train-alert-deploy paradigm a way of life.

But every unit cannot stay fully trained and ready to deploy indefinitely. Soldiers have to go to schools. They get promoted and move on to different jobs. Red Cycles (base support periods) dull a unit's tactical edge. Services have to be performed on vehicles.

A major issue that now faces the Army is, "How do you sequence units to enable them to train, alert, and deploy?"⁶ Obviously a unit will have to train to a desired level of proficiency, get certified, and then go on "ready" status for possible alert for specific missions. That means protecting the unit during training and while in the "ready" status. During the "ready" status, it must sustain its proficiency. While one unit is on "ready" status, another will have to be training to replace it on the "ready" status.

This concept is not foreign to the Army. Ranger and Airborne units do something similar now. One unit is in "ready" status, while another is recovering or off. The unit in "ready" status knows that for a certain amount of time, it must be prepared to deploy immediately. Future operations will compel the entire Army to embrace this cycling. This will, of course, impact on resourcing, manning, scheduling, equipping, and facilities, among other things.

How the Army will implement this paradigm remains to be determined. The implementation could be similar to the current process III Corps has established for brigades as they prepare for their NTC rotation. The brigade in preparation has priority on all the training resources – virtual, constructive, and live (including gunnery). Other brigades perform Red Cycle tasks and train less. An NTC rotation could be the certification event for a brigade completing its training prior to going into the "ready" status. When it goes into the "ready" status, the brigade conducts training to maintain its readiness for deployment. During the "ready" status, the brigade would be prepared for nearly immediate deployment. A major hurdle to overcome would be the personnel turbulence immediately following current NTC rotations that effectively brings units out of the band of excellence.

It is clear to the authors that the Army is moving to a train-alert-deploy cycle. This will require sequencing of units into training for deployment, maintaining readiness for deployment, and recovering from deployment. Also, the personnel system will need to be adjusted.

Training Fundamentals

Training Structure

During the digitization experience, the level of structure in digital training has varied. Some of the variance resulted from the absence of training support packages, while some resulted from

4ID commanders wanting freedom to modify the training. Feedback from the commanders interviewed after their tours provided generally similar insights.

A structured environment is needed in initial training to make sure soldiers and leaders learn the lessons you want them to learn. For the SBCT at Fort Lewis, the determination of what was to be learned became a team process. A team of battalion commanders developed a “best way” for their soldiers and units to perform tasks and a standard approach to task training. The benefit from standardized training was more repetition and more training. Units did not waste time and resources preparing training or figuring out how to train.

Structured training is useful for individual training and for platoon and company exercises. There needs to be a progressive sequence of training that can be used in Sergeants Time. It needs to start with easy exercises for reporting and basic communication with digital tools. The entire program should be similar to the Unit Conduct of Fire Trainer (COFT) matrix that allows soldiers to progress to ever increasing levels of complexity.



Platoons and companies need to be able to perform tactical drills. This is best achieved in structured-lane training type exercises. These can be virtual or live, but they should not be free play until basic proficiency has been demonstrated.

Above the company level, the Army needs a structured program for leader and staff integration training led by brigade and battalion commanders. It should sustain operator and low-level collective staff task proficiency. A former 4ID commander described the training as a set of scenarios with enemies and expected outcomes. He referred to the concept as a Staff COFT, which brings with it the idea of a matrix that facilitates step-like increases to higher and higher levels of proficiency.⁷ A small set of exercises would be needed to bring the competency to a certain level. Beyond that level, “What right looks like” is not known.⁸

As the level of training moves up (especially when it reaches battalion and brigade collective training and the multiple battlefield functional areas with their associated digital tools begin to interact), the structure needs to be more flexible. This flexibility is necessary for knowledge- and agility-based organizations to more fully utilize the capabilities of digitization.

An example of restricting a unit’s flexibility is the arbitrary 0600-hour crossing of the Line of Departure in live exercises. Digital units process information about the enemy continuously. An unmanned aerial vehicle may provide information that the enemy is particularly vulnerable for the next two hours. The friendly force should be able to attack to capitalize on the situation. The critical point is that once units reach a certain level of proficiency, training exercises must accommodate the nature of knowledge- and agility-based organizations.

Digital training is complicated by the requirement for the right tips and cues, the right friendly and enemy icons on the screen, and the right supporting elements displayed where they should be, especially for battalion and brigade exercises. The story line has to be aligned from top to

bottom – all the icons have to support the same story. Battalions, and likely brigades, do not have the experience, expertise, or time to do this. These complexities drive structure in the training.

In the view of the authors the question is “What do you structure and what do you not?” There must be a balance between the two. Too much structure constrains the unit from reaching even higher levels of proficiency. Too little structure wastes the energy and resources of the unit.

Day-to-Day Training in Garrison

Digital skills are perishable. Compounding this perishability is personnel turbulence in units. If soldiers, leaders, and units do not train regularly on system-focused skills, units will not remain proficient in digital operations. This drives a critical need for a garrison capability for day-to-day digital training. The ABCS should be used in all headquarters from Battalion through Corps to pass taskings, e-mail, plans, schedules, and anything else that is possible. Force XXI Battle Command Brigade and Below (FBCB2) devices should be in company orderly rooms in place of commercial e-mail systems.

In addition to the day-to-day exercises, a digitally focused exercise needs to be done at least once a week with the individual operators on their boxes doing what they would be doing if they were in a tactical exercise. The training should involve all levels in the Brigade Combat Team (BCT). In an ideal case, every Friday morning, all echelons within the BCT could be collectively executing digital training. Platoon Sergeants and Leaders and Company Commanders and First Sergeants would spend this time in their vehicles powering up all their systems, working with them, and sending messages. Soldiers and leaders need to be involved and proficient in the digital skills. You cannot expect this of them if they only get to train in preparation for major events.

Day-to-day use of the digital tools in garrison may alleviate much of the skill decay associated with digitization.

Embedded Training

If units are going to spend a half-day each week in garrison training on their systems, they need some type of embedded training capability. Few of the leaders participating in the MASC-XXI effort had experience with embedded training, indicating that the technique has not been used to meet training requirements. The ideal solution would be to conduct training with the actual tactical system mounted in its platform (tank, Bradley, howitzer, or whatever) in the motor pool, during deployment or in assembly areas while rehearsing for actual combat. Each system would need a training switch that would put it in a training mode. Using commercial power instead of running tactical vehicles to power the systems could enhance this solution. This ideal solution is moving closer to reality.

The discussion on embedded training must include what training to embed. Such training can easily address the basic system’s “knobology.” Several digital systems already have built-in modules to train basic operator skills. Embedded training could also provide the training associated with software drops. Each time new software is distributed to units, updated training modules could be simultaneously embedded in the software.

On the other end of the scale, the challenges with synchronization at battalion and brigade levels are likely too hard to address via embedded training at this time. However, the goal for digital

tools is to achieve a mission rehearsal capability. Such a capability will also provide solutions to the most difficult challenges associated with synchronization and integration at brigade and battalion levels.

The authors believe that embedded training can benefit digital performance. Technology will bring embedded training into a unit's motor pools and assembly areas. But, embedded training requires analysis to determine its most appropriate uses and the associated cost-benefit tradeoffs.

Training Simulations

The authors concluded that the repetitive training needed to produce highly competent units and battle staffs dictates the use of simulations – virtual, constructive, and live. In the proper mix, all three types of training contribute to the progressive, cost effective establishment and maintenance of digital proficiency. Determining the right combination to meet a given unit's needs is a key to successful transformation training.

In the case of staff training, a commander of the 4ID stated, “The Corps Battle Simulation (CBS) is entirely too large, too expansive, and too expensive to do the ‘reps’ needed by battalions, brigades, and division staffs under the new Force XXI design.”⁷ The digital transformation clearly indicates a need for a low-overhead driver (LOD) with training packages that set conditions to train the staff. The goal is to provide the commander the ability to walk into a facility and say, “You sit at this box. You sit at this box. Okay, all the boxes are manned, now start the simulation.”⁹ This LOD should allow the unit to put the new Intelligence Officer (S2) into the simulation and bring him/her up to speed with the rest of the staff team. Better yet, the LOD could enable unit staffs receiving new digital tools to jump-start their learning process and keep it on a fast track.

It was pointed out that the absence of an LOD handicaps digitized units. The BCTs (much less battalions) do not have the resources and expertise to build such exercises. They cannot afford to spend a week building a simulation exercise that lasts a couple of hours. They need to be able to walk into a facility and execute an existing exercise package. Units need to focus on being trained, not on developing the exercise in which they will be trained.

In the view of several leaders, providing the repetition required to produce highly proficient staffs and units requires low-overhead simulations that commanders can leverage with minimal preparation and resources.

Live Simulation

“You have to get soldiers and units in the field. You have to train in the field.”

MG Ben Griffin, 3 May 00

Many subordinate commanders in the 4ID became comfortable training in virtual and/or constructive environments. While generally supportive of such training, all the leaders stressed the importance of executing a healthy amount of live training in the field. Virtual and constructive environments generally do not provide the stress associated with live training, and certainly not the “in the dirt” reality of the NTC. The friction of live training frequently overwhelmed commanders who had only synthetic environment training experience.

Live field training stresses the entire organization – people, equipment, vehicles, communications, tactical procedures, everything. Discovering reality happens most quickly while fighting at the NTC against a real opposing force (OPFOR). The digital challenges come into special focus in that environment. As one brigade commander said, “When I spread the BCT over the doctrinal distances spanning the width and breadth of the NTC, I generated a whole new set of problems.”¹⁰ The brigade had to contend with a battlespace 35 kilometers wide and 40 kilometers deep. The time-distance factors in the field are important because digitization does not make the unit’s tanks and Bradleys move any faster.



Leaders interviewed felt that live training, preferably at the NTC, is imperative for determining the good and bad of any new concept or idea. Decisions should never be made on a proposed concept until it has been put through its paces at the NTC.

The authors agree with the leaders that there is no substitute for live training to truly stress systems and concepts, especially live training at the NTC.

Self-Development

Self-development was frequently the only method available to leaders in the 4ID when it first received the EXFOR mission. Subsequent leaders faced a similar situation and an even steeper learning curve. They had to close the gap between themselves and other leaders in the 4ID. Today, formal education in digital operations is coming on-line and will support leaders as they are assigned to digital units. As the Army moves to the FCS and the Objective Force, self-development will again likely be the method individual leaders use to prepare themselves for the challenges they will face.

Change and Transformation information – articles, reports, lessons learned, computer-based instruction, etc. – describing the cutting edge must be focused so leaders and soldiers can use their limited time productively. Underlying the ability to get focused information is the requirement for gathering and assembling the information.

A factor in self-development is the amount of time required for soldiers and leaders. How much time should a soldier spend during the normal duty day? How much after normal duty hours? Can time for self-development be incorporated in institutional courses? The concept of a finite amount of energy is applicable here. You can work people longer and harder for only so long, and then there is no more energy. Units need to be sensitive to the impact of self-development on the quality of life of their leaders and soldiers.

The authors are convinced that self-development will continue to play a key role in the Army’s Transformation. Technology will facilitate getting current and effective materials to individuals when and where they can best use them. The challenge is to balance self-development demands with all the others that are placed on soldiers and leaders.

Team-Focused Training

Training and Operating as a Team

Experience with the 4ID and the SBCT highlights the importance of stability in training teams to achieve high levels of performance. An example illustrating this was an infantry squad in the SBCT with the mission of clearing a room in a live fire exercise in the Fort Lewis “shoot house.” If two new soldiers were put into an infantry squad, the squad was considered unsafe despite past squad proficiency in clearing a room. Every man in the squad had a specific position, area of responsibility, and aiming point. Introducing new people into the squad would result in someone being in the wrong place at the wrong time. The insight captured from the leaders’ interviews was that when a new soldier arrived it was necessary to go back to training and restore the squad as a collectively functioning team.

In much of the digital training the Army has done, team training has been facilitated by stabilizing units undergoing the test or experiment. The earlier section on *Training Environment and Enablers* described the 4ID’s extensive stabilization for the Division Capstone Exercise. The requirement to maintain the team’s powerful digital skills drove them to keep certain soldiers throughout the train-up and actual exercise. The key individuals included primarily vehicle commanders and gunners, battle captains, ABCS operators, and communication specialists from the signal battalion.



The 4ID’s 1st BCT provides another example of the impact of breaking up a team. Immediately prior to an NTC rotation, it had to replace four company commanders. The only source of digitally smart captains was the BCT itself. The captains that were used as replacements were performing some other critical function. After a year of training the battle staff, the unexpected turbulence caused major problems. Every reassigned captain had a key position on some team. Because of mutual interdependence, each move had a ripple effect. This emphasizes the need to keep the staff and company teams stable.

In addition to stabilizing large numbers of warfighters, the 4ID also identified the need for commanders to battle roster their ABCS operators early just like combat crews. The digital skills were perishable, and the amount of training was expensive. Battle rostering caused the leaders to make careful decisions before they moved an ABCS operator to become a truck driver or Bradley gunner. They had to consider the implications of such moves on the unit (the team) and the training plan.



It is clear to the authors that the importance of training and operating as a team has increased in the digital environment. First, there is no replacement pool of digitally smart people to plug into the team. Second, the cost of digital training makes re-training prohibitive.

Leader Competencies

Recent discussions of leader competencies for the FCS and the Objective Force highlight challenges associated with extended battlespace and information demands. Future leaders will need to be agile, flexible, adaptable, and multi-functional. Isolated on the battlefield, they may have to perform tasks associated with ranks several levels above today's leaders.¹

Some might ask: Are these requirements really so different from what the Army has desired of its leaders in the past? For the most part, they seem to be the same competencies that leaders were expected to possess in the preceding decades. Some of the words have changed, but what future leaders will need to do is similar to what Army leaders have always done. Leaders have to be technically competent, mentally and physically tough, trained in Army doctrine, and capable of responding to the situation in which they are placed. The future may require more emphasis on some new competencies, but leadership qualities being discussed for future leaders are similar to those of today.

This is another case where the authors are left with a question: "How do we provide the opportunities for the desired traits and skills to develop and mature more quickly?" This "how" needs to be addressed now, so that actions can be set into motion to produce answers and solutions.

Leader Expertise

As leaders joined the digitized force, they were normally slotted to receive supervisor training. Some senior leaders disagreed strongly with this policy and wanted the leaders to attend operator courses as well. Attending both courses provided the leaders a much more detailed knowledge of digitization and the digital systems. They gained the expertise to talk about how to best use the digital tools. They could be creative in expanding what could be done. More importantly, it enhanced their authority. They had the technical expertise needed to act like a digital leader. "It got them closer to a level of authority that would normally have come from ten or more years of experience. And most importantly, they did not have to defer to subordinates who had a much more detailed knowledge."¹⁰

Another senior leader used the example of captains who were slotted as battle captains or company commanders when coming into the BCT. They were expected to be technically competent, but they were not provided any digital education. Placed into important leadership positions, they ended up being the least digitally knowledgeable people in their units.

We noted that sergeants experienced a similar situation, but most did not have the computer background the officers had. The sergeants found themselves threatened by technology with which most of their subordinates were comfortable. Senior sergeants tended to focus on basic soldier skills like field craft and NBC, and passed off the digital tasks to younger soldiers who were more comfortable with them. During any digital transition, sergeants need to be educated in the Basic NCO Course and the Advanced NCO Course on their digital responsibilities. This will give them the tools needed to balance basic soldier skills with the equally important digital training their soldiers need.

In the authors' opinion leaders deserve training that provides them the knowledge required to demonstrate technical competence, if not expertise. Only with this knowledge can they exercise the authority their subordinates expect.

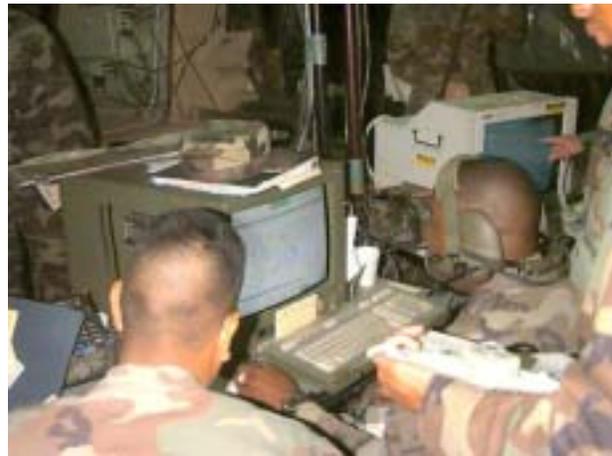
Staff Training

“A proficient staff is a group of individuals performing successfully a set of complex, interrelated procedural tasks in a collective environment.”

COL Bob Cone, 6 Dec 01

Early on, the 4ID recognized the importance of being proficient in the basic warfighting skills. Proficient staffs were built by starting with the basic warfighting skills. Next they were taught how to use the ABCS technology. Then they learned how to apply the technology to the basics. The result was a high-performing staff. The approach emulated the basic process applied to produce lethal platoons.

One BCT had soldiers first participate in classroom training on individual tasks for their assigned ABCS system. They were then immersed in a collective staff environment with the task of executing a collective staff action such as “pass an overlay.” Passing the overlay required individual operator actions that were linked. When each task was done rapidly in the appropriate sequence, the operators could see the potential of the digital tools and the relevance of their task performance. The understanding by staff soldiers of their role and its importance facilitated the development of high-performing staffs.



Digital systems enable staffs to operate more efficiently and effectively. To do so requires repetitive training of staff fundamentals (e.g., analyze a situation and maintain a running estimate) using the digital systems. Staffs have to be more than tactically proficient; they have to be experts with the digital systems. Staff officers given the time tended to become operators of the systems and were better at it than the people initially trained as operators. More repetitions of staff training result in higher proficiency; better use of the systems capabilities; and, finally, a highly competent staff. A strong consensus in the 4ID held that highly competent staffs are critical to digital operations.

The authors noted that digital operations require highly proficient staffs that have been trained repetitively in tactical fundamentals and digital skills. Development of a proficient digital staff begins with operators proficient on their ABCS system. A highly proficient staff emerges when the individuals meld into a high-performing team whose members/collaborators are knowledgeable across the battlefield functional areas.

Value-Added Outcomes of Effective Digital Training

The following paragraphs highlight capabilities that the authors believe are beneficial and that seem to be outcomes of good, repetitive training by high-performing digital units.

Multi-functionality

The digital transformation created situations that forced a remarkable integration of information. In an analog Tactical Operations Center (TOC), the stovepipes representing the battlefield functional areas typically stay separate. The engineer staff representatives are less aware of what the Fire Support Element (FSE) is doing. In the digital TOC, the engineer and fire support personnel are drawn together via situational awareness. The engineer cannot help but know that the FSE is shooting artillery and what the target is. He also realizes that it is his job to determine if an obstacle would support the operation. He gets involved because he understands what is going on; he benefits from situational understanding.

As tactical information became more available in the 4ID, there was a natural increase in multi-functional play. It was hard for soldiers to stay solely in their lanes when they realized that what was happening next to them affected them, and they could do something about it. Warfighters were acquiring multi-functional skills because it was important to them. A little knowledge pushed them to acquire more. People tended to become familiar with other functional areas, then understood that they needed to be more knowledgeable, and finally gained expertise across multiple areas.

Multi-functionality “will be a natural outcome of the process. It’s all part of the way you design your information architecture – what information is available to whom and then how you go about using the information. We will redefine multi-functionality.”¹⁰

The authors believe that multi-functionality is easier to train than is generally understood. Staffs in the 4ID developed it because soldiers were in positions in which they could see the possibilities and envision the options to do something about it.

Risk-taking

Leaders often pointed out that digital units are bolder and take what would appear to be greater risks than analog units would. One reason for this is the information digital units have. Knowledge of the enemy and the friendly forces eliminates many previous unknowns – the very unknowns that prevented commanders from taking action.

In the analog world, units tried to determine what was happening to them on the battlefield. The radio-transmitted question “Where are you now?” was easily the most often transmitted message. Digital units are now trying to interpret what the enemy will do. The voice traffic is different. “Where is the combined arms reserve now?” “What do you see them doing?” When the enemy’s probable course of action becomes clearer, taking the appropriate action against him is much easier. Predicting what the enemy will do will never be a sure thing. But digital information allows leaders and staffs to eliminate variables and act much earlier and more rapidly than before.

The second reason units can be bolder is the digital commander’s ability to articulate his intent and communicate changes based on the tactical situation. This helps subordinates make decisions

because they know what their commander would want them to do. Again, more and better knowledge facilitates decisions and actions that would not have been considered when the knowledge was not available. Proficient digital commanders and staffs use their systems to gain and pass information. This information is converted to knowledge, which enables both the staff and subordinates to be bolder and take what would have been unacceptable risks in the analog world.¹¹

It appears to the authors that digital units will execute missions of increasing risk compared to analog operations. This will result from leaders and staffs reaching higher and higher levels of proficiency, recognizing opportunities when they are presented, and becoming comfortable with their ability to take advantage of the situation.

Agility

Agility is the ability to respond quickly to change. The authors believe that units became more agile as their digital proficiency increased. In an operations-centric environment where concept and intent are closely linked, there is little time for in-depth staff analysis and planning. Using the concept and intent as a basis, the staff has to plan bottom-up, deconflict fires and airspace, and focus the intelligence assets.

Field Training Exercises (FTX) provide hints at the agility possible in transitioning from one mission to another. In one exercise, a BCT commander received guidance from the Commanding General early in the evening. Planning using digital tools began immediately, based on the commander's concept and intent. Basic graphics with commander's intent were distributed to subordinate units within hours. Commanders and key leaders linked up to discuss the upcoming mission while their units moved to positions designated in the basic graphics. Resupply was executed as the units moved into the assembly areas.

The BCT was able to go into the fight the next morning with an understanding of the commander's intent and concept and a common set of graphics. The complex transition from one mission to another was done in less time, over difficult terrain, and at night.

Based on such observations the authors believe that increased agility will come when training has produced highly proficient staffs and leaders who are comfortable with the systems and who understand what their commander wants.

Overcoming Tactical Isolation

"The power of information appears able to overcome the fear and anxiety of isolation."

COL Bob Cone, 6 Dec 01

The size of the digital forces' battlespace has caused much discussion on the challenges associated with soldiers being isolated on the battlefield. During the Division Capstone Exercise at the NTC, the 3rd Battalion 67th Armor was stretched out about 15 kilometers. Tanks were dispersed with visual contact being the exception. In an analog environment, the distances that separated them would have been unacceptable. The BCT commander asked some of the battalion's soldiers, "You must have really been bothered when you were isolated out there?" The response was, "I knew right where everybody was all around me. I wasn't alone. I knew that the next icon

was over here, the next icon was over there.”⁹ What seems like a great distance when warfighters need visual contact to have awareness of others is not when they have digital awareness.

It seems that the digital tools gave the soldiers knowledge comparable to what they got from visual contact. This knowledge appears to have compensated for their isolation. Their comfort level was similar to what soldiers get from being with or seeing their buddies. Acceptable distances become greater in the digital world. The power of information provides a digital awareness that reduces the anxiety that would seem to come with isolation.

It must be noted that the soldiers’ comments were based on a training event, and the comments above are, at best, initial impressions. They warrant further study before any valid conclusions can be reached. However, it appears to the authors that soldiers confident in their digital systems’ situational awareness seemed much more comfortable with the physical isolation associated with the battlespace distances in which they operated.

Battle Lab Role in Transformation

“We can theorize about how we are going to do [digital operations], but until we get what is going on here in the Mounted Warfare Test Bed right, it is just theory.”

COL Bob Cone, 6 Dec 01

When asked what he would have done differently about training, a former 4ID BCT commander responded, “I wonder – if we would have taken time to develop more fully the doctrine and training enablers, could we have gotten a better product? It would be better thought out. The TRADOC schools could do some self-policing and quality control before they provided it to the brigade.”⁶ There is no doubt that some of the second or third order questions could be identified and possibly answered within the division and perhaps in the TRADOC Battle Labs. If more analysis was done up front, the overall Transformation might happen a little faster.

Another former BCT Commander from the 4ID was interviewed during experiments being conducted by the Mounted Maneuver Battlespace Lab (MMBL) at Fort Knox. His experience in the MMBL led him to suggest using their simulation capabilities to get at some of the training requirements.

High priority programs to field advanced technology should obviously benefit from the contributions of the Army’s Battle Labs. Why risk soldiers believing fielded technology does not work? The Battle Labs facilitate looking at specific capabilities and determining what truth is. They can help avoid the friction associated with some part of the system not working. For example, the MMBL could have discovered much more about operating with only three companies before the Army eliminated the fourth from the maneuver battalions.

Because the Battle Labs can facilitate development and then confirmation of organization, doctrine, and soldier capabilities, they could be used to develop the best training methodology. Evaluating a requirements-driven organizational concept in a Battle Lab against a variety of enemies would reveal a lot early in the Transformation process. Documenting the methods used to train the soldiers who participated in the exercises would provide a foundation for effective training methodology. Follow-on Battle Lab assessment would help shape the training methods and techniques in a progressive fashion. Proficiency requirements, performance assessment

needs, measurement techniques, and feedback procedures could all be addressed systematically. The end result would be a training methodology tailored to the units that will actually receive the digital tools of the FCS.

It seems obvious to the authors that the Battle Labs, with their simulation capabilities, should support development of training requirements and methodologies for the digital force as well as future forces.

Summary

This concludes the chapter on the insights gathered by the authors who have been with the MASC-XXI project since it began. The insights are based on interviews with former 4ID senior leaders and the I Corps Deputy Commanding General for Training and Readiness. The intent was to provide training focused discussion and conclusions that will impact the FCS and the Objective Force. The next two chapters will provide insights by two General Officers who participated with the Army's Transformation while on active duty and following retirement.

CHAPTER 3 - INSIGHTS ON FUTURE OPERATIONAL TRAINING

The insights in this chapter come from LTG (Ret) Leonard D. Holder, who served as the Combined Arms Center Commander; as Division Commander, 3rd Infantry Division; and as Commander, 2nd Armored Cavalry Regiment. He reviewed the complete set of MASC-XXI interview transcripts and applied his knowledge from extensive participation in the training of digitized units. His insights focus on issues in training and training support that will affect the FCS and the Objective Force.

The following sections organize the discussion:

- ◆ Key Observations
- ◆ Requirements for Current and Future Training
- ◆ Insights on Future Training.

Key Observations

Unvalidated Status of Warfighting Concepts

All worthwhile training must be based on sound combat concepts, and training performance helps define the real limits of new tactical capabilities. As yet, the Army has not presented validation to support the practicality of the concepts for fighting the digitized brigades and divisions, much less the Objective Force. Therefore, as they train, leaders should view the underpinnings of those concepts (the 100 x 120 km division battlespace with near-perfect situational awareness and unlimited communications connectivity) as optimistic. Commanders should be wary of the built-in biases of projective simulations used as well as the assumptions-based, simulation-driven training at the Combat Training Centers (CTCs).

Time-Space Constraints in Training

In spite of assertions of the growing size and high tempo of future operations, today's training under-represents time-space dimensions. Except for a few AWEs, Army training takes place in constrained physical space over limited periods of continuous operations. Trainers of transitional units will have to overcome an over-emphasis on tiny areas, small units, and leisurely tempos if they are to create realistic training environments. To press the limits of the possibilities and to learn what is and is not possible, they will have to insist that training areas and simulations create conditions of rapid Operational Tempo (OPTEMPO) across great areas. Finally, they should act to concentrate at least as much attention on brigade and division operations as they have on those of companies and battalions/task forces.

Tactical Information Flood

Future battle command systems will make information available on an unprecedented scale. The data flood from higher to lower echelons has been talked about for years. Just as importantly, though, information flow will also move laterally between all units and staffs generating huge information requirements that users themselves will often satisfy without higher level involvement. Commanders will not just have access to vast stores of externally provided information; they will also be able to provide their units information from any source on the Worldwide Web.

Any training that omits this dimension (including provision of detailed information on the air and ground tactical situations far from the unit's Area of Operation [AO]) will mislead participants as to the true nature of operations.

Future training will need huge and flexible supporting databases both to push robust information to commanders and staff leaders and to respond to whatever Requests for Information (RFIs) leaders desire. Such databases will have to evolve with the training scenario. Second and third order effects of tactical decisions – everything from changed attitudes among allied troops and foreign civilians to logistical consequences of high usage materiel rates – must be part of the training “wrap-around” situation.



Failure to Apply Training Doctrine

Dynamic technical changes will not eliminate the need for deliberately planned and executed training. Some of FM 25-100's content is outmoded. For example, the METL, as developed previously with relatively few essential tasks, may now consist of so many tasks that all cannot be trained adequately. However, the doctrinal emphasis on detailed, well-coordinated training plans and protected training execution remains valid. Most commanders ignore those requirements, and much of the chaos that typifies Army training stems from that disregard. One brigade commander put it this way: “We have always had great training doctrine. We just haven't followed it...We have not provided the battle focus that's required to protect units from distraction.”¹⁰ In order for any training program to deliver its full potential, the Army will have to provide stability in the planning and preparation phases just as it arranges for fast-paced change in execution.

Requirements for Current and Future Training

Adapting to Fundamental Tactical Change

Forming New Habits Through Training

Objective Force units will have to overcome the drag of well-established habits and practices developed by their soldiers and leaders in earlier assignments. Teaching the new concepts of the Objective Force will probably not be difficult – the 4ID's warfighters learned EXFOR ideas readily. Adapting or replacing formerly successful methods, approaches, techniques, and procedures will be harder.

Information management has long been identified as one of the challenges of digitized forces. Most 4ID interview participants commented on the subject, but they generally minimized the difficulty of making the adjustment. By the time the first Objective Force units form, leaders will be comfortable with the data loads that saturate today's systems. Training technologies will, in part, need to represent the automated parsing of information and allow leaders to probe into the details of summaries and estimates that machines give them.

Future leaders will have to discover more subtle changes for themselves and alter their training practices to account for them as they go. In the 4ID, for instance, experience showed that sensors and databases satisfied elements of the Commander's Critical Information Requirements (CCIR) faster than previously and that the pace of operations created a need for revising CCIR more frequently than in the past. Commanders of the Objective Force should expect to have their own capabilities similarly expanded and should plan to devote more commander training time to CCIR development. It is reasonable to assume that future commanders will have to view their battlespace differently and that their training will have to force them to decide early about CCIR over a large area and revise information requirements frequently to get the full benefit of better sensors, weapons, and communications.

The first generation of digital leaders also discovered that FBCB2-based self-knowledge changed tactics. Among leaders in the 4ID, more certain situational awareness encouraged greater tactical boldness. That is, when a commander knew the exact location and strength of his troops, he could accept risk over greater periods with greater confidence. Leader training should represent that condition and accustom Objective Force leaders to making bold, timely decisions.

Leveraging New Technologies

Improved situational awareness also changed some aspects of operating at night or in limited visibility. "Seeing" blue forces in detail despite fog or darkness simplifies maneuver and reporting and allows for complexity in limited visibility operations that was formerly unwise. For instance, operating tank or infantry battalions in close proximity to each other or requiring one to relieve or pass through another in the dark was very risky. The FBCB2 permitted such actions to occur with much greater precision and greatly reduced risk. At the same time, digitized unit leaders had to bear in mind that moving the platforms themselves at night remained difficult because of the problems of seeing the ground, judging its passability, and identifying mines or small obstacles.

Objective Force warfighters will employ robots that are unaffected by light conditions; they will likely have to learn to demand a higher night tempo than is now sustainable. They may even find that the humans in the loop are the greatest brake on their night tempo. (One possible solution will be to minimize human participation, either by making soldiers passengers in robotic carriers or by pushing machines to the front and people to the rear in limited visibility conditions.)

Technology-driven changes like this did not occur to doctrine writers or to trainers at first. Once apparent, though, they altered practices for leaders throughout the digitized brigade. Objective Force performance doctrine; Tactics, Techniques, and Procedures (TTPs); Standing Operating Procedures (SOPs); and training standards should be established early and revised frequently to make units perform to design capacity. Generally, that means that performance standards should require faster decisions, nearly continuous operations, and ambitious norms for movement and tactical opportunism.

Training the Full Force

Except for their participation in AWEs, EXFOR brigades could not train to their full capabilities at the NTC. Unless the full brigade (all three assigned battalions/task forces) was present, training failed to represent actual brigade operations. Brigades need to operate with all their maneu-

ver battalions, have access to realistic levels of combat support, cooperate closely with the air component and “see” the rest of the division including forces to the front and rear.

Given the time-space dynamics of the Objective Force, its long striking range, and its access to information, full-scale FTXs will be necessary for effective training. Operating in isolation or in attenuated task organizations complicated training for the EXFOR and created inaccurate impressions of its overall operating capabilities. Objective Force training should include full force training as a matter of principle.

Leveraging the Power of the Digital Staff

Automated battle command tools make the unit staff a more potent combat multiplier than in the past. Digitized staffs using today’s improved situational awareness tools have better abilities to keep operations coordinated. They can more effectively oversee active operations, anticipating and correcting potential problems before they come to the commander’s attention. They can also manage events with greater precision and therefore add significantly to the economy of force of every operation. Their contribution to operations in progress is far greater than in the past, and their training will therefore become more important in realizing the full combat potential of any advanced technology unit.

Future training design and assessment should document the contribution that good staff work makes. This will necessitate new staff training guides that establish tasks and standards for staff sections and for staffs as integrated teams. (Inherent in this design is the need to measure the contribution of the commander as well.) As staff automation progresses, decision support tools should evolve to include means of capturing human input for training assessment. There is no reason for future systems to lack the means to provide trainers with data on the effectiveness of individuals and groups.

Much has been made of parallel planning, “rolling estimates,” and other variations of established staff procedures in 4ID training. Much of the resultant commentary overstates the novelty of the technique. Most of the aggressive staff practices portrayed as new are actually nothing more than rediscovery of past staff techniques. Nonetheless, the 4ID experimented with some promising new tools (most notably the Battlefield Visualization Planner) and learned to exploit the ability of staffs to act more directly and influentially in brigade and division operations. Objective Force training should regularly incorporate higher staff participation that both assists and complicates battle command within the unit.

Training Skip-Echelon Command and Control

The improved ability for higher headquarters to coordinate small elements of the force will also require doctrinal and training attention in the Objective Force. In the first digitized brigades, brigade commanders acquired scout units of their own for the first time and learned that they could gain greater effectiveness by coordinating the actions of their scouts with those of their battalions. This improvement in brigade reconnaissance and security came at the cost of removing scouts from battalion control. Thus, while brigade reconnaissance improved, battalions lost important aids to reconnoitering routes and areas of interest to them alone. Training standards for battalions still do not account for the change in their capability that brigade control of their scouts imposes.

It is likely that the commander's ability to take control of key elements of sub-units will also characterize Objective Force operations. If so, then consequences for smaller units of losing control of assets should show up in standards that change when the higher headquarters controls any of their components. When the higher commander chooses to do that, training assessments must reflect the transfer of capabilities and responsibilities and clearly show commanders the pros and cons of their direct management of small elements of their organizations.

Facilitating Initial Reorganization

Setting Realistic Readiness Expectations

Several 4ID leaders pointed out that combat readiness and force modernization are mutually exclusive. In modernizing the 4ID, commanders had to face enormous training problems while simultaneously coping with the intricacies of equipment transfers and the human dynamics of unit reorganization. These challenges affected their readiness for several years.

The Army should therefore consider excluding Objective Force units from full readiness requirements during the time necessary for their reorganization. From the trainer's point of view, this simplifies the job of teaching the new force how to fight and bringing it up to an initial level of combat capability. (Authors' note: The unit set fielding concept being executed by the Army may address the training issues noted here.)

Training Unit Leaders in Advance

Where radically new ideas are concerned, training should begin with leader instruction in tactical concepts and in plans for developing the force. There may be useful precedents found in the Army's forming of its first attack helicopter units and its first air-mobile division. Examining Air Force experience in fielding stealth squadrons might also be instructive.

In any case, leaders should be systematically trained ahead of unit activation to prepare them to receive new equipment, plan effective training, and teach the troops. Exempting new units from most or all administrative details during their first year of operation would also help embed the new methods in the force.

Providing Front-End Training Documentation

For the FDD, concept papers provided draft doctrine that sufficed for division and brigade levels. Battalions and companies lacked such provisional doctrine for some time. As a result, smaller units had to create their own "doctrine" spontaneously. While companies operated more or less as before, battalions changed considerably.

Training documents came even later in the FDD. Lacking Army Training Evaluation Program (ARTEP) or Mission Training Plan (MTP) tools, the first digitized units trained without a clear idea of tasks or standards. This made levels of training and relative progress very hard to access. Objective Force doctrinal and training documents should be issued with equipment, understanding that they will be imperfect but better than no guidance at all.

Service schools bear the responsibility for providing tactical doctrine and related training materials, but Objective Force organizations must cooperate in producing these. The TRADOC oversight was disjointed in supporting 4ID with doctrinal products. Involvement of the schools varied

according to available resources and the interests of branch chiefs. At the same time, the 4ID was deeply engaged in the mechanics of change. It provided varying levels of feedback on TRADOC products. In fielding the Objective Force, senior leaders will have to provide for better connections between the training base and the units. Virtual collaboration may help smooth this relationship if senior leaders involve themselves. In any case, TRADOC needs to approach the problem deliberately, laying out production plans for doctrinal and training products and providing for regular revisions in synch with major training events in the units.

Setting the Personnel Conditions for Success

Personnel managers should anticipate the skills that will be most necessary, and then provide for the recruitment and training of soldiers and leaders with the best aptitude for the new technologies and the best record for adaptability. To succeed, such an effort would identify personnel for the First Unit Equipped (FUE) a year before activation. It may be beneficial to assign leaders to the Objective Force who excelled in SBCT transition or demonstrated special aptitude in similar efforts.

In managing personnel, Army leadership should plan for more than the first cohort of leaders. In earlier trail-blazing units (e.g., 3rd Ranger Battalion, EXFOR), selected cadre filled out new units and got them off to a good start. Their block departure, however, resulted in a third-year drop in training performance. Replacements for initial leaders should be as carefully chosen as the first group itself to maintain the Transformation's momentum. One of the digital leaders noted that an Additional Skill Identifier for digitally trained soldiers might help manage the assignment of digitally proficient soldiers.

Additionally, personnel managers can reinforce training readiness by carefully timing the replacement of senior leaders in order to avoid mass turnover and ill-timed reassignments. Both of these problems plagued EXFOR. Additionally, tracking and managing repeat assignments of experienced soldiers to Objective Force units is a simple, reasonable, and beneficial idea.

Personnel managers can – and should – contribute to transformation by providing best-qualified warfighters and avoiding time-critical disruptions.

Preparing adaptive leaders is a key challenge. There are trade-offs between careful grooming of officers for well-defined duties and the need to replace casualties or relieved leaders. In Objective Force units, leader training should prepare the leader group broadly rather than concentrating on individuals in specific jobs. The old truism about leaders being prepared to assume responsibility for the next level of command probably still has value. Both TRADOC and the units share in this leader training responsibility.

Synchronizing Enablers with Unit Reorganization

Implementing organizational changes in the FDD based on new capabilities before those capabilities were available impaired training and operations. Specifically, implementing the new Division Support Command (DISCOM) organization, reducing battalions from four to three maneuver companies, and creating brigade reconnaissance troops all went forward before the technology that supported the changes arrived. This led to frustration, inadequate training performance, and leader and soldier doubts about basic EXFOR concepts. Tactical concepts based on new capabilities must be resourced before organizations change.

Getting the CTCs up to Speed

Before Objective Force units arrive at a CTC or the Battle Command Training Program (BCTP), the CTC and/or BCTP should be fully prepared to support their training. In the 4ID's case, this involved new scenarios and supporting simulations, special training for the OPFOR and observer/controllers (O/Cs), and some technical modifications to range communication systems. Where digitization was concerned, the O/Cs lacked detailed knowledge of Force XXI concepts as well as tools to monitor digital communications and capture key data for training assessment. This impaired training and resulted in loss of potentially valuable CTC feedback. In the future, the CTCs must be fully equipped and qualified to allow Objective Force units to train effectively from the outset.



This preparation is expensive and will necessitate travel of CTC trainers to the units well before CTC training. The CTCs' communications and data collection capabilities will have to be modified to accommodate frequent changes in software, hardware, and doctrine in the early years of Objective Force training. Managing key people to permit simultaneous training of O/Cs and unit leaders and to arrange for assignment of some experienced Objective Force trainers to the CTCs would strengthen the connection between the units and the CTCs.

Expanding Training Simulation Capabilities

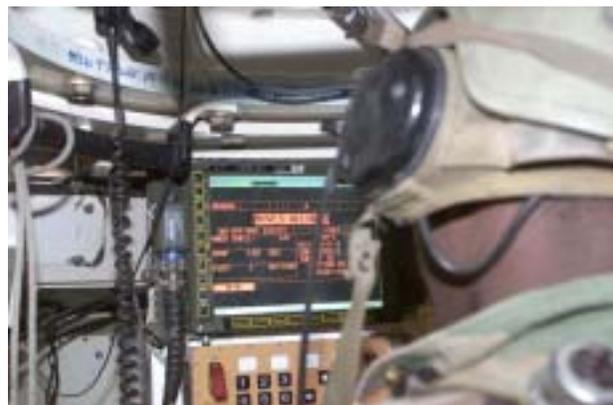
As noted in the preceding section, simulation support to training also deserves special attention. The Objective Force will need flexible, realistic simulations beginning in its first months of existence. These will serve best if they support multiple simultaneous exercises at different echelons within the force. They should be built to allow for easy changes of organizations, capabilities, and physical environments to accommodate the numerous adjustments that will certainly typify the early years of the Objective Force. By the time New Equipment Training (NET) occurs, a user-friendly, technically accurate simulation or plug-and-play emulation should be available to Objective Force units and the schools.

Sustaining the Transformation Process

Early Objective Force units will likely continue to change as tactical concepts mature, as new equipment is fielded and as force developers modify organizations based on tests and early experience. The 4ID dealt with this dynamic continuously in the years following its designation as the EXFOR.

Maintaining Operator Proficiency

Digital operator proficiency is hard to establish and maintain. The operator and team training situation facing commanders and staff leaders today resembles that which artillerymen confronted when their branch first adopted automated fire direction equipment. As the Army



fielded those tools, artillerymen learned that using them well required continuous practice. Eventually, they learned to drill Fire Direction Centers (FDCs) and FSEs regularly and to manage assignment by Military Occupational Specialty (MOS) to ensure the FDCs and FSEs kept qualified operators in position. The Military Intelligence branch has followed a similar path with its All Source Analysis System (ASAS). Objective Force trainers can expect to meet similar challenges in sustaining operator proficiency.

Creating Continuity Among Trainers

Keeping knowledgeable, permanent trainers and managers at training support facilities (battle simulation centers, range control elements, soldier training facilities) counteracts some of the turbulence that comes with regular rotation of soldiers. Permanent on-site trainers understand past issues in training support, hardware/software fieldings, and operating procedures. They can help facilitate transitions when new materiel arrives, and they can quickly analyze and correct training problems. A former brigade commander suggests that contractors – including highly experienced former officers like the BCTP senior mentors – fill key training support roles. The United States Army Europe (USAREUR) idea of assigning digitally qualified mentors to Objective Force brigades and battalions might also be considered.

Synchronizing Incremental System Development with Training Schedules

Aligning hardware/software development and delivery schedules with the EXFOR training schedule posed tremendous problems. Long-range product development plans rarely ran on schedule and training almost always paid the price in cancelled events and inefficient execution. The quality of modified or new technical products has been so unsatisfactory that, when introduced, they have typically wrecked existing networks. Delays in delivery have routinely disrupted training plans, destroying stability and forcing cancellations or disappointing execution.

To note a single example, the 1999 fielding of new software for FBCB2 was originally scheduled to give the 4ID's 1st Brigade time to integrate it into its operations months ahead of its 2000 NTC rotation and concurrent LUT. In reality, the software release arrived a few weeks before the brigade departed for Fort Irwin, far too late to allow essential training with new functionality. Everyone concerned lost in this affair: training was severely degraded for 1st Brigade, the LUT failed to produce the results it should have, and soldiers of the brigade lost confidence in their leaders, their equipment, and the Army in general.

Change is inevitable in the Objective Force, but it need not occur chaotically. Where several changes in related technologies are planned, the system of systems should be brought in simultaneously rather than as a series of separate fielding events. If systems miss deadlines, the Army should delay their fielding rather than upsetting complex training schedules and thereby degrading readiness. Force developers usually argue that improved capabilities are worth the pain of disorganized fielding. They are not. To protect training time and quality, materiel fielding must be more flexibly linked to training events.

Leveraging Institutional Training

Schools have to support early Objective Force units with trained leaders and soldiers more effectively than they did for the EXFOR. As with the CTCs, personnel managers should staff the

schools with a cadre of experienced teachers as the initial new force soldiers and leaders begin to be reassigned.

In the early days of Objective Force staffing, the service schools should provide limited-enrollment courses for students bound for Objective Force units. At some point, every Army leader will need to have a basic appreciation of Objective Force capabilities and design. As the Objective Force matures, the schools should begin teaching the lessons learned to officers and NCOs.

Advanced Individual Training and Primary Leader Development Courses also have a role to play. They should relieve Objective Force units of the responsibility for teaching every new soldier the basics by providing appropriate technical instruction to soldiers en route to Objective Force units.

Ideally, TRADOC should graduate trained soldiers and leaders in coordination with Objective Force unit stand-up and with major system fieldings.

Keeping Simulation Capabilities Current

Simulations must keep pace with evolving Objective Force capabilities to ensure an effective training environment. In some cases, simulations will be the primary means of portraying the force capabilities. Managing the fielding of simulations and their integration into training programs, along with enhancements and upgrades, will therefore be as important as hardware/software development. The simulations for Objective Force system and collective training support should be developed and upgraded in coordination with the force as a whole.

Insights on Future Training

Adapting to Large-Scale Information Availability

Objective Force units' access to information will be almost unlimited regardless of echelon. This has major implications for fighting and for training. It may lead to reorganizing staffs and reallocating time as commanders' decision making changes and staffs seek information from sources other than their higher headquarters.

It is impossible to foresee the exact changes in staffing that could result, but, as an example, the combination of intelligent automation, robotics, and air/ground sensors might lead to concentration of fire support staff soldiers at a few levels of command with automated processors taking their place elsewhere. Similarly, time standards for tasks may change radically because of the same technologies. While troop leading in small fighting units may not be substantially reducible, planning and decision time now allocated to higher levels of command may be subject to considerable compression. Training plans will have to be organized to give decision makers realistic information support while also putting them under the pressure of tough time standards.



Freeing Commanders from Command Posts

Digitization ought to free commanders from TOCs, not keep them there. In the EXFOR, technology limitations kept many commanders in their CPs when they would have preferred to be closer to the fight. In reality a capable staff will inform the commander of developments and perform tasks based on broad guidance, telling him what he needs to know orally or with graphics sent to forward locations. Additionally, more and more data will be transferable to command platforms regardless of their location. Taken together, improvements in Command, Control, Communications, Computers, and Intelligence (C4I) should free commanders from their CPs almost completely. Trainers will therefore have to provide input to commanders in forward positions. This will mean feeding images and messages to air and ground command platforms that approximate what commanders will be able to see and hear forward of their CPs.

Harnessing Planning and Visualization Tools

Digital planning and visualization tools will continue to improve, giving commanders new means for collaboration and decision making. Future battlefield visualization aids should bring sophisticated simulations to bear on pending discussions and semi-autonomously evaluate/compare courses of action for commanders and their staffs.

Objective Force leaders should expect to be equipped with sophisticated, easily modified battlefield visualization aids that simplify inter-element consultations and bring more and better information into those discussions. A relatively simple “orders assistant” that compares options and generates high quality draft orders is easily foreseeable. In essence, such a program would write rules-based directives, nominate coordinating instructions, and resolve or highlight subtle conflicts within a plan. Such an application would further reduce the time for orders production and distribution and avoid human errors in performing common planning tasks (e.g., assigning routes, creating boundaries, or installing supplementary control measures around objectives or link-up points). Such applications will require that staffs train not just to use them but to use them critically and quickly, employing them at the right times and substituting human judgment for automated products when appropriate. Training modules built into battlefield visualization aids should assess staff effectiveness in their use and mark key decisions for later critique.

Tracking Current and Future Operations

Assuming that Objective Force operations will be more oriented on execution than planning, another set of capabilities for tracking operations and anticipating future actions should be developed. These programs would factor movement and consumption rates, unemployed and committed capabilities, and friendly and enemy options into coming time increments and alert leaders to the emergence and disappearance of opportunities and vulnerabilities. To get full benefit of such decision aids, leaders will have to understand the dynamics of directing operations better than they do today. This calls for different approaches at service schools and at the CTCs. Today’s emphasis on the Military Decision Making Process (MDMP) will have to be balanced with equal stress on the principles and mechanics of execution. Without ingrained understanding of these things on the part of leaders, the value of automated tools will be limited.

Moving Beyond the Close-Range Fight

“Massing effects” has become a catch phrase over the past decade. The Objective Force will be able to do this far more effectively and over far greater areas than today’s organizations. Training must reinforce the successful massing of effects when it occurs. Today’s insistence on assuring a close-range fight will have to be overcome. While close-range fighting will still occur and will remain decisive, the Objective Force will, in fact, control greater space and interdict enemy movements in depth more effectively. Training design will have to reflect that reality.

Dealing with Future Threats

Asymmetric threats will remain a matter of concern. Enemy forces will find new ways to avoid the strengths of the Objective Force and focus on its vulnerabilities. Training opponents of the EXFOR did this only rarely. Objective Force training should confront modernized forces with unconventional and difficult threats in at least half the training.

Training with Diverse Partners

Less capable partners will also continue to participate in future operations while multi-national forces may remain politically and strategically necessary. The Objective Force should therefore train with less advanced partners routinely. Means of applying complementary strengths (U.S. Army long-range sensors and weapons combined with foreign infantry-heavy forces) should be part of doctrine and training.

Embracing the Logistics Environment of the Future

Advanced Combat Service Support (CSS) concepts will accompany the fielding of the Objective Force. Training programs for those concepts should be in place from the beginning. If key enablers lag behind combat elements (as they did in the case of the EXFOR), reorganization and training should be based on the existing CSS structure.

Enforcing Software Compatibility

Finally, the interoperability of units depends on uniform – or at least compatible – software. The fielding of multiple versions of software for the ABCS complicates training and operations for the EXFOR to this day. Objective Force software systems can and should be fielded and upgraded in rational sequences enabling interoperability at every stage of their deployment. Failure to do so would have considerable negative effects on training and readiness.

CHAPTER 4 - INSIGHTS ON TRAINING INFRASTRUCTURE FOR TRANSFORMATION

This chapter presents the insights of LTG (Ret) Robert S. Coffey, who served as the first Commander of the EXFOR (4ID, later designated as the FDD). Immediately prior to that, he was Commander of the NTC, where he participated in the first Force XXI AWE (Digital Rotation 94-07). He also served as Chief of Staff, III Corps, and as Deputy Commanding General and Chief of Staff, USAREUR and Seventh Army. The insights in this chapter stem from his reviewing the MASC-XXI interview transcripts and applying extensive personal experience in Army digitization. The insights focus on training support and Transformation issues that will affect the Objective Force.



Presented in a rough order of priority, the broad observations in this chapter are not intended to explore matters in depth or exhaustive detail. Rather, the insights represent areas for future exploration or consideration in support of Army Transformation.

The following subsections organize the discussion:

- ◆ An Abundance of Distractions
- ◆ Installations as Transformation Agents
- ◆ The Framework for Change
- ◆ CTCs as Centers of Excellence
- ◆ Army Testing and Evaluation (T&E) Challenges
- ◆ Designating a Unit as Focal Point for Transformation
- ◆ Extending the Lessons Learned Process

An Abundance of Distractions

The overwhelming single point that emerged from the MASC-XXI interviews of digital leaders was the costly distractions imposed on units as they prepared for transition to digital operations. Everything from equipment turn-in to the “duffle bag drag” of personnel shuffles was a major distractor from training. This was due in large part to the lack of a coherent strategy or installation-level plan designed to assist these units as they went through changes to become “digital units.” Installation staffs and systems seem to be driven by old paradigms of “how the Army has always done business” instead of recognizing that change is happening at a pace and scope that is currently, and will continue to be, unprecedented in Army history.

The leaders interviewed were not overly concerned about the difficulties associated with digital system training (e.g., reliability, connectivity), but rather the lack of protected time to train on the tasks at hand. This seemed to occur primarily because of the great multitude of tasks that were required to be done concurrently as units attempted to “set the conditions” for Transformation. To echo a brigade commander’s statement from the *Digital Leader Insights* chapter, “We have always had great training doctrine. We just haven’t followed it.”¹⁰ Many leaders echoed the judgment that there was nothing wrong with the training doctrine; they just could not follow it due to all the competing demands.

Installations as Transformation Agents

Units (battalion level) must remain the main focus of Transformation, but installations need to be staffed and funded to play a major role. The Directorate of Logistics should be supporting the turn-in and rapid processing of equipment. As discussed earlier in the *Digital Leader Insights* chapter, linkage between training and the budget/programming process is lacking. The Directorate of Plans, Training, and Mobilization lacks the resources to oversee/operate digital ranges. The Directorate of Information Management should be resourced to provide digital training enablers like a fixed “unit level tactical internet” enabling digitally equipped units to train with their “on board/embedded” equipment without having to deploy the divisional signal battalion to gain digital connectivity each time a battalion or company needs to train. Additionally, access to simulations/emulations and stimulations to drive digital systems are needed at installation level. Such devices can provide a “wrap-around” digital environment to provide soldiers, on demand, an environment through which embedded training could enable the “train as you fight” paradigm.

At installations like Fort Hood and Fort Lewis, where the density of digitally equipped units is high, economies of scale can be realized by focusing the resources at installation level to enable units to train properly. This is especially true since not all units will be fielded at the same time, given the unit set fielding concept. The investment in fixed tactical communication sites and enhanced telecommunication access through fiber optic or wireless systems in unit areas and motor pools would greatly improve the ability to implement our training doctrine.

Since the Army personnel system had difficulty supporting the stabilization and/or identification of soldier experts in digital training, a plan to hire master trainers in key positions through contracting should be considered. Master trainers with system expertise would allow units to maintain a training focus instead of wasting valuable training time merely trying to establish connectivity. Army installations are not normally included in the transition planning until it is too late to affect the outcome, resulting in units shouldering the burden. Additionally, the current regionalization of installation functions could result in the total loss of visibility of requirements at the unit level and should be reviewed for its ability to support and manage change.

The Framework for Change

The foregoing discussion brings into focus the lack of an overarching Army model for managing Transformation as a change enterprise. Certainly the Army leadership has created a clear vision and set ambitious milestones for Transformation. However, the problems noted above indicate there is a need for an overall, comprehensive framework for managing, resourcing, integrating,

and synchronizing the change process. The technology focus on a system of systems (end-state oriented) needs to be accompanied by equal focus on a system of organizations and a system of resources (process oriented). In other words, systems thinking should be extended to a master blueprint for orchestrating and resourcing the transition to the Objective Force. A systems approach to transition – how to move from one force structure to another – would go a long way toward alleviating the problems experienced so far with funding, training time, qualified trainers, installation assets, etc.

Numerous authors, such as GEN (Ret) Gordon Sullivan, have examined the process of change in corporate and military arenas. A resounding theme is the importance of creating a team of teams to champion the senior leadership’s vision and intent.¹² Aligning the critical organizations to the required roles and tasks is a challenge. Concentrating on the journey (transition) as opposed to the destination (end state) provides a realistic framework for integrating and synchronizing change-driven activities. Monitoring the transition activities is a prerequisite to making adjustments from a strategic perspective. Above all, having a high-level model to anchor and guide the change process is essential.

In the *Digital Leader Insights* chapter of this report, a special organization to manage and integrate training of the future force was proposed. In similar fashion, a special organization to direct and integrate the process of change is needed, with broad executive authority. A mandate to integrate all stakeholders, planners, and executors; to coordinate requirements and schedules across all Doctrine, Training, Leader Development, Organization, Materiel, and Soldiers (DTLOMS) domains; to ensure that resources are placed where needed; to identify and resolve conflicts; and to evaluate progress from a system of systems perspective would make the organization a true Transformation integrator. Perhaps the concept is not so different from the Louisiana Maneuvers Task Force of the early 1990s, with greater emphasis on resource integration and evaluation. Such an organization would be a powerful enabler for achieving the Army’s Transformation goals – on schedule and on target.

CTCs as Centers of Excellence

The Army’s CTCs are not resourced to train the units they service. By 2004, 65 percent of the unit training rotations at the NTC will be digitized. Currently neither CTCs nor home station installations have adequate capabilities to implement and evaluate digital training. Unless this shortfall is addressed now, units again will shoulder the burden in the form of lack of readiness and confidence in their systems. Future transformed units will require greater battlespace and greater “stimulation” to allow leaders to understand and experience the true promise of enhanced situational understanding and lethality advertised for the Objective Force. The CTCs have historically been the “engines of training change” for the Army, driving excellence in units and leaders through tough, realistic training. Currently, the CTCs stand on the verge of becoming irrelevant if not properly resourced with digital systems and digitally experienced O/Cs. An added benefit to the Army of digitizing the CTCs is the rapid experience/insights O/Cs will gain and feed back to units and the Army at large.

Nowhere in the Army is there a “center of excellence” dedicated to digital operations. It fleetingly resides in the 4ID and then dissipates as soldiers/leaders rotate in and out. Due to the OPTEMPO and focus at the NTC, O/Cs will naturally become experts on digital systems and

how such systems affect the outcome of battles. Because only CTC O/Cs have a natural “perch” from which to observe training in its closest form to actual combat, their insights and observations are critical to the maturing of systems and TTPs. As such, the CTCs should naturally become “centers of excellence” for transformed unit operations. Two of the leaders participating in an NTC rotation as a digitally equipped unit supported the idea that CTCs must become digitized and that training at home station, CTCs, or in combat should be the same. This observation will also hold true for the BCTP as division and higher headquarters become more digitally mature along with their subordinate units.



As computing power increases, commanders will move away from TOCs to mobile command vehicles and personal digital devices while remaining connected to the situation through their “virtual staff” or “reach-back.” The CTCs must have access to and evaluate these enabling technologies, thus providing invaluable feedback to leaders, soldiers, units, and the testing community as well as the development contractors. The Army has not fully leveraged or effectively resourced the CTC concept.

Army Testing and Evaluation Challenges

The Army’s T&E Program is outdated and dysfunctional, ill-suited to meeting the needs of the Army of the Future, especially the development of the Objective Force. The old ways of doing testing and evaluation led to the often-frustrating comments of 4ID leaders concerning the ever-changing software drops and new hardware/software associated with digitization. Changes to software will be the only constant for the future; the civilian marketplace is seen as the driver for telecommunications, not the Army. Therefore, the ability to effectively test and evaluate commercially available software and hardware is a function that the Army Test and Evaluation Command (ATEC) must integrate into their modeling and simulation tools and their testing approach. However, this need not be a cause for alarm if the Army testing and evaluation community adopts the changes outlined in a recent ATEC White Paper focusing on the FCS.¹³ Among other things, this white paper calls for:

1. A fully integrated contractor and government testing and evaluation program.
2. Maximum use of modeling and simulation throughout testing and evaluation.
3. A systems integration lab to support and integrate development, testing, and evaluation.

Designating a Unit as Focal Point for Transformation

The need for a dedicated tactical unit to participate in the Transformation process was a recommendation in the ATEC White Paper.¹³ The EXFOR experience highlighted the synergy gained by having a dedicated unit in which the developmental contractor and testing community could have unfettered access for feedback. This energized the “spiral development process” leading to

cost effective and timely changes in systems. An FCS-dedicated tactical unit should be located at Fort Knox to better leverage the Unit of Action Maneuver Battle Lab and TRADOC. The concerns over simultaneously turning in equipment while trying to reorganize would also be reduced by having such a dedicated unit. Economies of scale could be realized, allowing the installation and Army to focus resources and expertise. Additionally, the Army's personnel system could better manage assignments/stabilization of key personnel to meet needs and reduce turbulence. Program Executive Offices and Program Managers could coordinate efforts to ensure critical gates are met. The ATEC could focus resources. And lastly, the senior Army leadership could better understand the impacts and dynamics of change across the DTLOMS through a "directed telescope" on a single unit undergoing coordinated, measurable testing and evaluation of specific technologies, systems, organizations, operational concepts, and ideas as opposed to a limited view of one specific "system" affecting "one specific program," as is done so often today.

Extending the Lessons Learned Process

The Army's systematic approach of learning by studying previous operations and exercises shines a spotlight on the TTP impact of Transformation. The same lessons learned spotlight should shine on the process and dynamics of managing change. The current Transformation of the Army as envisioned in the U.S. Army White Paper, *Concepts for the Objective Force*,¹ highlights the challenges the Army will face this decade. Changes will occur at an unprecedented rate due to warfighting doctrine and technology, and the challenge of managing the change process will accelerate. Documentation of both the destination (Where did we get?) and the journey (How did we get there?) must keep pace. Trained observers of change should be "embedded" in the unit designated to lead the Transformation process. These observers would capture, in real time, observations and conclusions about obstacles, effective solutions, failed solutions, mid-course corrections, etc. The feedback loop would be completed by an at-large means for rapidly sharing the lessons with those units about to undergo transformation.

CHAPTER 5 - CONCLUSIONS AND RECOMMENDATIONS

The leaders interviewed during the MASC-XXI project represent the Army’s core of digital experience at the Colonel and General Officer level. The 4ID and SBCT leaders’ lessons learned, supported by the insights provided by the retired General Officers in Chapters 3 and 4, provide a foundation for building a success-primed training program for the Objective Force. This foundation points to significant actions the Army can take starting now. Table 2 presents the overall conclusions and recommendations, all anchored in the Army’s Transformation experience, reached by the authors of this report. By applying the lessons learned and pursuing the recommended actions, Transformation leaders can achieve a decisive training advantage. The challenges of the Objective Force and the FCS demand nothing less.

Table 2. Conclusions and Recommendations

Conclusions	Recommendations
1. Training Proponency	
No single organization had the authority, responsibility, and resources for digital force training. The lack of central direction led to disjointed efforts at TRADOC schools and FORSCOM installations.	Establish one organization with overall responsibility for Objective Force training. Integrate units’ cutting edge expertise with service schools developing doctrine and training products. Collocate working elements with Objective Force units.
2. Training Doctrine	
Current training doctrine is conceptually sound. Updates are needed to reflect the diverse missions of the Future Operational Environment.	Revise training doctrine to accommodate the future force environment. Review the METL concept in light of current operating conditions. Consider designating "ready brigades" for immediate deployment and providing for rotation of the ready brigade mission between corps and division units.
3. Training Strategy	
Digital transformation stumbled because it lacked a training strategy. Delay of doctrine, TTP, and SOPs forced units to develop their own. Training documents came even later. Home station installations took on training development, without resources.	Develop Objective Force training strategy early, before units get involved. <ul style="list-style-type: none"> • Ensure TRADOC is involved up front. • Leverage Battle Labs to support development of training methods. • Establish production plans for doctrinal and training products, to include pre-planned revisions that synchronize with major training events. • Issue training documents with equipment.

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Table 2. Conclusions and Recommendations (Continued)

Conclusions	Recommendations
4. Training Resources	
Digital training consumes additional resources in units, institutions, and self-development. Training in basic warfighting skills takes as much time as ever.	The organization responsible for Objective Force training must determine the resources needed, program the funding requirements, and distribute the resources to the appropriate organizations.
Innumerable tasks compete with digital transition and seriously erode the time available for training.	Army leadership should take vigorous steps to protect the time available for Objective Force units to conduct essential training.
Installations have been called on to play key roles in digital transformation, but they are not resourced to provide adequate support.	Acknowledge the mainstream role of installations, then program the resources (people and dollars) needed to support the Objective Force. Invest realistically in installation infrastructures.
5. Operator Proficiency	
Digital operator proficiency is hard to maintain. Routine use of digital tools in garrison would counter skill decay.	Incorporate into the training strategy the requirement and capability to use digital systems in garrison for day-to-day operations.
6. Leader Training	
<p>Experienced digital leaders demonstrated traits desired for Objective Force leaders:</p> <ul style="list-style-type: none"> • Multi-functionality resulted from seeing and seizing opportunities to influence the fight. • Agility stemmed from highly proficient staffs and leaders who understood their commander's intent. • Bolder, higher tempo operations became common with the confidence to take advantage of opportunities. • Anxiety of isolation on the expanded battlefield abated with better situational awareness. 	Study the characteristics of increased boldness, multi-functionality, agility, and isolation-resistance on the battlefield to determine how to promote them and how to develop supporting traits. Leader training should then be tailored to accustom Objective Force leaders to risk, isolation, multi-functional requirements, and other dimensions of the Future Operational Environment.
Self-development will play a larger role in the education of Objective Force leaders. Technology will facilitate getting current and effective training to individuals when and where they can best use it. The challenge is to balance self-development demands with numerous other demands.	Increase the information (Center for Army Lessons Learned Reports, Computer-Based Training, journal articles and papers, etc.) available to leaders, streamline the process for leaders to access the information, and realistically balance self-development demands with others.
NCOs and Officers deserve the knowledge required to demonstrate technical competence, if not expertise. Only with this knowledge can they exercise the authority expected of them by their subordinates.	Where new ideas and technologies are involved, training should begin with deliberate leader instruction.

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Table 2. Conclusions and Recommendations (Continued)

Conclusions	Recommendations
7. Staff Training	
<p>Digital operations require highly proficient staffs – staffs that are more potent combat multipliers than in the past. A highly proficient staff develops when the individuals meld into a high-performing team whose members are knowledgeable across battlefield functional areas. This occurs only with repetitive training in both fundamentals and digital skills, conducted against a competent OPFOR that stresses the staff.</p>	<p>Ensure that repetitive staff training is part of the training strategy, and develop the means to provide such training to units. Objective Force training should consider:</p> <ul style="list-style-type: none"> • Realistic emphasis on execution (vs. the MDMP process), assuming Objective Force operations will weight execution more than planning. • Routine representation of higher Headquarters participation that both assists and complicates battle command. • Leveraging sophisticated, easily modified Battlefield Visualization tools that simplify cross-element interaction and bring more and better information. • Measurement of the contribution made by effective staff work.
8. Embedded Training	
<p>Though the digital transformation has made little use of it, embedded training clearly has value. Technology can bring embedded training into motor pools and tactical assembly areas. The challenge is to determine its most appropriate uses and the associated costs.</p>	<p>Conduct analyses to determine embedded training's most value-added uses and the associated life cycle costs.</p> <ul style="list-style-type: none"> • Can embedded training be used in lieu of the numerous white boxes being deemed necessary? • Can embedded training meet the synchronization challenges associated with battalion and brigade training?
9. Training Simulations	
<p>Repetitive training for high-proficiency staffs/units requires low-overhead simulations. By the time the first units begin NET, a user-friendly, technically accurate simulation will be needed in Objective Force units and TRADOC schools. Simulations will provide, in some cases, the primary means of portraying Objective Force capabilities.</p>	<p>Assign high priority to developing, fielding, and integrating simulations. Deliver flexible, realistic simulations to the first Objective Force units as NET begins. Capabilities required:</p> <ul style="list-style-type: none"> • Robust support of multiple simultaneous exercises at different echelons. • Easy changes of organizations, capabilities, and physical environment. • Freedom for commanders to operate from combat vehicles (i.e., input to commanders in forward positions). • Large, flexible databases to feed tactical information.
10. Live Training	
<p>There is no substitute for live training, especially NTC training. Full-scale FTXs at home station and the NTC will be essential for effective training.</p>	<p>Emphasize and resource live training as a habitual practice in the Objective Force. Key considerations:</p> <ul style="list-style-type: none"> • Realistic time and space dynamics. • Extended striking range. • Abundance of broadly-based information.
<p>By operating in isolation or in attenuated task organizations, the EXFOR gained inaccurate impressions of its overall capabilities and challenges.</p>	<p>Objective Force training should stress full force exercises as a matter of principle. If the full force cannot participate then demanding simulations should emulate the missing units.</p>

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Table 2. Conclusions and Recommendations (Continued)

Conclusions	Recommendations
11. Emphasis on Team Operations	
<p>Force XXI units stabilized their organizations for major events to prevent disruption of teams. Teamwork holds greater importance in a digital environment.</p> <ul style="list-style-type: none"> • No replacement pool of digitally smart people existed. • The cost of digital training made start-over retraining prohibitive. 	<p>In the fielding plan for the FCS and Objective Force, set as a goal the fielding of equipment and crews as a system. Then optimize stability of teams through supportive personnel policies.</p>
12. Combat Training Centers	
<p>The NTC was not fully trained or equipped in time to support the EXFOR's digital rotations. Digitization necessitated new scenarios and supporting simulations, special training for the OPFOR and O/Cs, and technical modifications to range communication systems.</p>	<p>Provide the equipment and training to the Combat Training Centers and BCTP to enable Objective Force units to train effectively and receive the appropriate support.</p>
<p>The Army has no center of excellence for digital operations. The CTCs are in an ideal position to take on that role.</p>	<p>Designate one or more CTCs to form the center of excellence for digital operations. Resource the CTC(s) to play a vigorous cutting-edge role.</p>
13. Personnel	
<p>Personnel managers have a major impact on transformation. They can help set the terms for success of the future force. Conventional assignment approaches can create huge cyclic turnover, ill-timed reassignments, and loss of readiness.</p>	<p>Personnel managers should directly assist in maintaining proficiency of the Objective Force. They should:</p> <ul style="list-style-type: none"> • Anticipate essential skills. • Ensure recruitment of soldiers and leaders with success-primed aptitude. • Assure the incremental replacement of senior leaders.
<p>Keeping knowledgeable, stable trainers and managers at training support facilities (battle simulation centers, range control, etc.) helps counteract the turbulence that comes with regular rotation of soldiers.</p>	<p>Maintain a stable work force in organizations that support Objective Force unit training.</p>
<p>Permanent on-site trainers, who understand past issues in training support, system fielding, and operating procedures, can facilitate transition when new materiel arrives. They can quickly analyze and correct training problems.</p>	<p>Use contractors, including highly experienced former officers like BCTP senior mentors, to help leverage FCS equipment and Objective Force procedures. Consider USAREUR's idea of assigning digitally qualified mentors to Objective Force brigades and battalions.</p>
<p>The Army did not capitalize on the experience and expertise of the warfighters departing 4ID. They could have made a difference at TRADOC schools and NTC.</p>	<p>During transformation, assign soldiers who have gained experience and expertise in digital operations (EXFOR, SBCT, FCS, or Objective Force) to positions where the Army will benefit the most.</p>

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Table 2. Conclusions and Recommendations (Concluded)

Conclusions	Recommendations
14. Change Management as a Force Multiplier	
No overall, comprehensive model exists for managing, resourcing, integrating, and synchronizing the change driven by Transformation.	Establish an overarching framework for managing Transformation as a change-focused enterprise. Specify a Transformation Integrator, a team of organizations, and a network of resources.
Change in the Objective Force will be inevitable, but improved capabilities are not worth the pain of chaotic fielding. Transformation leaders can protect training time and quality by more flexibly linking change to training events.	Aggressively synchronize change. <ul style="list-style-type: none"> • Where several changes in related technologies are planned, field the entire complex at one time. • If technical changes miss deadlines, delay their fielding rather than disrupt complex training schedules.
The fielding of multiple versions of ABCS software complicated training and operations for the EXFOR. Interoperability among units was degraded.	Objective Force software systems should be fielded and upgraded in rational sequences that permit interoperability at every stage of their deployment.
Combat readiness and force modernization are mutually exclusive.	Consider excluding Objective Force units from full readiness requirements during their reorganization phase.
15. Train-Alert-Deploy Sequence	
The Army is moving to a train-alert-deploy sequence, departing from the past.	Institutionalize the cycling of units for emerging realities: <ul style="list-style-type: none"> • Training for deployment • Preparing for deployment • Recovering from deployment
16. Evaluation and Feedback	
The Army's T&E Program is outdated and unsuited for fully supporting the Objective Force.	Modernize the T&E Program, with emphasis on: <ul style="list-style-type: none"> • Integrating government and contractor T&E activities. • Maximizing use of models and simulations. • Establishing a systems integration lab to support T&E.
The EXFOR experience highlighted the value of having a single unit dedicated to experimentation and testing.	Dedicate a tactical unit to support Objective Force testing and experimentation. Stabilize the personnel assigned to the unit.
Capturing lessons learned about the process and dynamics of change has received little attention.	Extend the Army's Lessons Learned program to include the process and dynamics of managing change. Place trained observers in lead units. Create an easy-to-use mechanism for sharing the resulting knowledge.

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ANNEX 1

Participant	Duty Position	Date
COL Oscar Anderson	Commander, 1 st Brigade, 4ID	31 May 00
COL Oscar Anderson	Commander, 1 st Brigade, 4ID	6 Mar 01
BG Richard Cody	Asst Div Cdr for Maneuver, 4ID	21 Jun 99
COL Robert Cone	Commander, 2 nd Brigade, 4ID	15 May 00
COL Robert Cone	Commander, 2 nd Brigade, 4ID	2 Mar 01
COL Robert Cone	Former Commander, 2 nd Brigade, 4ID	6 Dec 01
BG Thomas Goedkoop	Dep CG for Training & Readiness, I Corps Formerly Commander, 1 st Brigade, 4ID	8 Jan 02
MG Benjamin Griffin	Commanding General, 4ID	3 May 00
COL Theodore Kostich	Chief of Staff, 4ID	12 Apr 00
COL Theodore Kostich	Chief of Staff, 4ID	13 Mar 01
COL Richard Lynch	Commander, 1 st Brigade, 4ID	21 Apr 99
MG W. Scott Wallace	Commanding General, 4ID	22 Jun 99

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ANNEX 2

Annex 2. Glossary			
4ID	4th Infantry Division	FORSCOM	U.S. Army Forces Command
ABCS	Army Battle Command System	FSE	Fire Support Element
AO	Area of Operation	FTX	Field Training Exercise
ARI	U.S. Army Research Institute	FUE	First Unit Equipped
ARTEP	Army Training & Evaluation Program	LOD	Low-Overhead Driver
ASAS	All Source Analysis System	LUT	Limited User Test
ATEC	Army Test and Evaluation Command	MASC-XXI	Managing at the Speed of Change in Force XXI
AWE	Advanced Warfighting Experiment	MDMP	Military Decision Making Process
BCT	Brigade Combat Team	METL	Mission Essential Task List
BCTC	Battle Command Training Center	MMBL	Mounted Maneuver Battlespace Lab
BCTP	Battle Command Training Program	MOS	Military Occupational Specialty
C4I	Command, Control, Communications, Computers, and Intelligence	MSTF	Mission Support Training Facility
CBS	Corps Battle Simulation	MTP	Mission Training Plan
CCIR	Commander's Critical Information Requirements	NBC	Nuclear, Biological, Chemical
COFT	Conduct of Fire Trainer	NCO	Non-Commissioned Officer
CP	Command Post	NET	New Equipment Training
CSS	Combat Service Support	NTC	National Training Center
CTC	Combat Training Center	O/C	Observer/Controller
DISCOM	Division Support Command	OPFOR	Opposing Force
DTLOMS	Doctrine, Training, Leader Development, Organization, Materiel, and Soldiers	OPTEMPO	Operational Tempo
EXFOR	Experimental Force	RFI	Request for Information
FBCB2	Force XXI Battle Command Brigade and Below	S2	Intelligence Officer
FCS	Future Combat System	SBCT	Stryker Brigade Combat Team
FDC	Fire Direction Center	SOP	Standing Operating Procedure
FDD	First Digital Division	T&E	Testing and Evaluation
		TOC	Tactical Operations Center
		TRADOC	U.S. Army Training & Doctrine Command
		TTP	Tactics, Techniques, and Procedures
		USAREUR	United States Army Europe

A020321TR_G07



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