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A PROPOSED TALKING PAPER FOR CG, TRADOC

Through the ADSAG I have been able to follow your activities, and have noted with strong approval your setting up the Adaptive Execution Office with the mission “to harness the creativity of DARPA program managers and America’s science and engineering community to transition DARPA technology to our warfighters faster and more effectively [and thereby] promote adaptability in DoD by getting additional technologies to the field more quickly and by advancing technologies that will help us build in adaptability from first principles.”

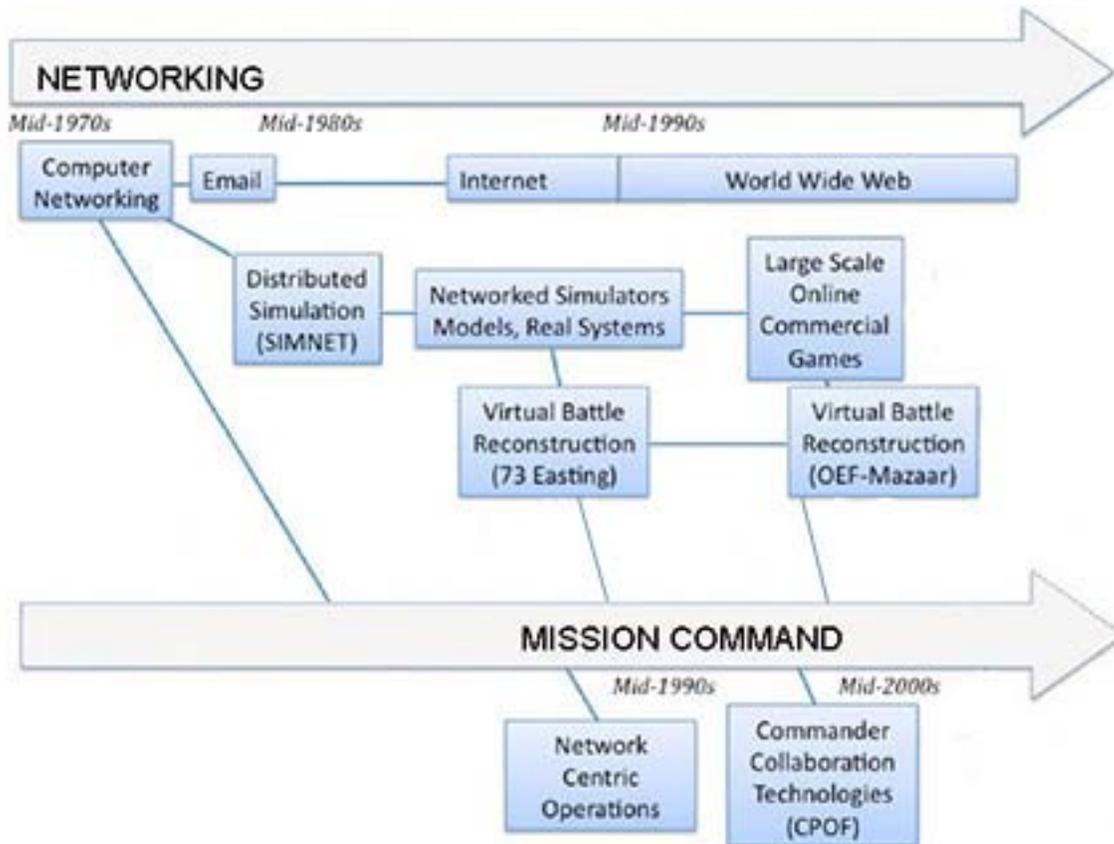
I am here to talk about collaborating with DARPA for three reasons:

First, technology interventions by DARPA have transformed the Army’s training over the past three decades. But we need such help more than ever, because wartime urgencies foreclose relying on past practices. Current Army S&T initiatives are unlikely to prepare warfighters for fast-paced, serial deployments that will tax their adaptability.

Second, I believe that the Army should train as it fights, using the same Mission Command networks and sensors for reconnaissance, surveillance, and target acquisition, in combat configurations or accurately emulated.

Third, for the measure/countermeasure contest with our adaptive adversaries, the Army must be able to portray for its training exercises and leader development the very latest enemy tactics, techniques, procedures, and materiel.

Regarding my **first point**, allow me to recognize DARPA’s key role, the source of the blue boxes below:



Army exploitation of DARPA’s innovation has not always been adroit — for instance, SIMNET took the Army’s existing training technique, Tactical Engagement Simulation, to a new level of cost

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effectiveness. But although fully mature for transition, SIMNET waited nearly two years for Army procurement, and even longer before it was fielded. I want you to know that I will do all in my power to prevent recurrence of such a failure.

You are familiar, I am sure, with the Army's Force Generation (ARFORGEN) cycle. From my perspective, there two major technology gaps limiting the effectiveness of ARFORGEN:

Inability to prepare units pre-deployment for the exigencies of on-going combat against an enemy that has proved to be more adaptive than us.

Inability to prepare leaders for Mission Command using up-to-date information on the behaviors of such an enemy.

Using its own resources, the Army is unlikely to close those gaps, for doing so will require nothing less than a revolution in the Army's current methods of preparing leaders and units for war.

You know, I am sure, that the capstone event in ARFORGEN units training is the Mission Readiness Exercise (MRE) at one of our Combat Training Centers. But experience has demonstrated that ARFORGEN cannot be paced efficiently with CTC scheduling for an adequate MRE. The alternative is to equip our key garrisons with CTC-quality training instrumentation to support MRE at home station. TRADOC has been working to that end for years with the Army S&T and Acquisition communities, but we do not have much to show for our efforts. The still-prospective Homestation Integrated Training System (HITS) is a miniature, transportable version of legacy CTC instrumentation: fixed towers that derive vehicular locus from RF trilateralization, transponders, and other infrastructure, including upgraded versions of the venerable (TRADOC-developed) Multiple Integrated Laser Engagement System (MILES)— old wine, new skins. Here is a visualization of HITS:



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Current Enemy TTPs

But even more important than training instrumentation is the design of tasks, conditions, and standards for collective readiness. That design should involve the migration of lessons learned in combat into units preparing to deploy— today that awareness-transfer is time-consuming and expensive in dollars and manpower. There is a critical time-lag between understanding in theater of *current* enemy tactics, techniques, and procedures (TTPs), and ARFORGEN's staging a training event that reflect such enemy behaviors, whether that event is intended to challenge a would-be commander, build teamwork within a command group, or provide a context for training whole units. That lag is such that any unit preparing for deployment is almost always training against yesterday's enemy, and it leads to flawed operational effectiveness when that unit first arrives in theater. (It is certainly true that most units experience the preponderance of their casualties in their first 90 days in combat.)

Real-Time CPOF Data Direct from Theater

With the assistance of JIEDDO, TRADOC has set up a Joint Training Counter-IED Operations Integration Center (JTCOIC), and has there demonstrated a nascent ability to capture real-time CPOF data direct from theater, to process that data to allow its transmission over NIPRnet, and to repurpose it for use in instruction. For instance, JTCOIC has demonstrated that, within hours of the event, it could illustrate for students at Fort Leavenworth the circumstances of a successful ambush in the Korengal Valley of Afghanistan. But we do not yet have ways and means to capitalize on such a capability for ARFORGEN, either for leader development or for collective training within ARFORGEN.

TTPs Used by Dismounted Units

Neither the CTC today, nor HITS when fielded, can record for after action reviews (AAR) the TTPs used by small dismounted units. Yet these are pivotal to BCT maneuver and wide-area security alike. Nor can HITS facilitate the use of UAS in relatively restricted air space. And HITS anticipates that OCS will derive MRE tasks, conditions, and standards from doctrine and dated reports, not from data fresh from operational theaters,

Operations and Training with Same systems

I am now convinced that, thanks to DARPA, the technology is at hand to revolutionize ARFORGEN training. I propose that TRADOC partner with DARPA to develop ways rapidly to repurpose actual combat data, and to adapt for MRE instrumentation such systems as DARPA's Autonomous Real-Time Ubiquitous Surveillance-Imaging System (ARGUS-IS, optical GMTI), Heterogeneous Airborne Reconnaissance Team (HART), and Remote Detection of Activity (RDA, unmanned ground sensors).

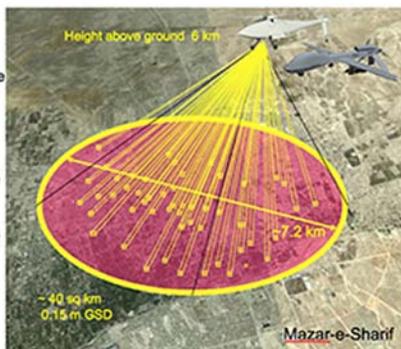
ARGUS-IS

Military Objective:

Real-time, high resolution video surveillance over large areas

Approach:

Single mosaic image from 4 offset focal plane arrays
Onboard image processing to stitch data into one large, seamless image
Operator controls to select 65 independently steerable video streams
Compressed data to fit one common data link



HART – Sensor Management & Airspace Deconfliction

- Move sensor management to theater as rapidly as possible (start with integration into ODIN)
 - Encourage rapid reduction of ISR TF restrictions on performance
- ISR TF funding acceleration to OEF employed Brigades
- Combine ARGUS with HART; brief VCSA, CSA, SecDef



RDA – Remote Detection of Activity

- Seismic Unattended Ground Sensors
- ISR TF funding production (10,000 units @ \$250)
 - First 5 units Jan 2010; production ramp up deliveries scheduled 3 months ARO
- Training/demo sessions have been held at Forts Lewis, Bragg, Huachuca
- Develop corresponding TTPs



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Interaction among such systems should be able to detect and to track surface movements of both vehicles and small elements on foot. ARGUS could provide videos of their behaviors, just the sort of information needed for After Action Reviews (AAR). HART, a system that tracks aerial surveillance platforms and depicts the coverage of their sensors, could add 3D to an AAR, not only aiding control of the air space over the training area, but also simulating specific platform/sensors unavailable for training. Networking the foregoing systems with RDA and other energy-efficient, low cost UGS could be integral to determination of locus for ground truth.

Upgrades to DARPA-initiated programs already deployed with Army forces in combat, such as CPOF and TIGR, would be most welcome.

Clearly the Army will want to transition such technology for operations, both to collect information on potentially hostile activity, and to overwatch friendly detachments to add to their security. If we could also, with DARPA's technical assistance, adapt them for training instrumentation, we could capitalize on cost-avoidance by canceling some or all of conventional training support. Moreover, we would be training the force prior to deployment to use them to advantage in combat, and at the same time generate resources that could be used to facilitate transition DARPA technology into the Army.

What I have been describing up to now could go a long way toward closing the gap in training a unit for the present wars. The clinching step would be a means to assure that unit a well-prepared commander, a leader whose perceptions, sensing, notions, and intuition have been tuned through experiential learning to understand Mission Command in all its complexity, to anticipate exigencies, and to remain proactively adaptive under stress. I believe that if DARPA can show us how to repurpose actual combat data to devise events for unit training, we can use the same source data to develop a cognitive development environment for present or prospective commanders. I would hope that DARPA could bring to such a development all its skills and experience with perceptual and encephalic analyses.

Finally, I would hope that DARPA could extend its creative work on empowering soldiers on patrol via ASSIST and its Transformative Apps programs. While up to now DARPA has focused on operational enhancements for the soldier, these are also by their nature instructive. There is probably a case for moving training for specific military occupation specialties from TRADOC schools and Training Centers into units, depending upon networked PDAs to convey to each soldier, on demand, information relevant to his duty performance, and reflective of his experience. If the Apps are cogently developed, they could also assist first line supervisors and the TRADOC in evaluating individual skill levels, providing remedial training where indicated, and helping to identify particularly effective soldiers for promotion and further training.