

Dragnet

A Case Study of the CLEAR System

Case Studies in National Security Transformation

Number 13

Samuel Musa, Matt Keegan and Giles Kyser



Sponsored by the Office of the Deputy Assistant Secretary of Defense
Forces Transformation and Resources

Prepared by the Center for Technology and National Security Policy



Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE 2007		2. REPORT TYPE		3. DATES COVERED 00-00-2007 to 00-00-2007	
4. TITLE AND SUBTITLE Dragnet. A Case Study of the CLEAR System				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) National Defense University, Center for Technology and National Security Policy, 300 5th Avenue, Washington, DC, 20319				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 16	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

The views expressed in this article are those of the authors and do not reflect the official policy or position of the National Defense University, the Department of Defense or the U.S. Government. All information and sources for this paper were drawn from unclassified materials.

Dr. Samuel Musa is a Senior Research Fellow at CTNSP conducting research in counter improvised explosive device (IEDs) and biometrics for human terrain mapping and counter insurgency. He is on Intergovernmental Personnel Act (IPA) to NDU from Northwestern University, where he is Associate Vice President for Strategic initiatives and professor of Electrical and Computer Engineering.

Matt Keegan is currently a Visiting Fellow with the Center for Technology and National Security Policy (CTNSP) focusing on information technology (IT) related efforts. He is a 2006 distinguished graduate of the Industrial College of the Armed Forces (ICAF) where he was an Industry Fellow sponsored by the Information Technology Association of America and IBM. He has over 15 years experience in aerospace, defense, and IT related fields.

Colonel Giles Kyser is a Marine Infantry Officer currently assigned as the Senior Military Assistant to the Assistant Secretary of Defense for Special Operations and Low Intensity Conflict and is a 2006 distinguished graduate of the Industrial College of the Armed Forces. He has an extensive operational background in both conventional and special operations and commanded a Marine Infantry Battalion Task Force in Iraq.

“The story you are about to read is true. The names have been changed (and in some cases deleted) to protect the innocent.”

Introduction

The opening narration of *Dragnet*, the long running TV series about two Los Angeles cops, could not be a more fitting way to open a case study on the Chicago Police Department’s (CPD) Citizen and Law Enforcement Analysis Reporting System (CLEAR) and its dramatic journey into the Department of Defense (DOD). The quickest way to describe CLEAR is to mention a quote from Ron Huberman, assistant deputy superintendent, Office of Information and Strategic Services at CPD “CLEAR automates everything we do in the [Chicago] police department, from personnel management to detailed field incident reports. *It includes the entire arrest and booking process: taking offenders into custody, mug shots, everything. CLEAR places it all in one integrated platform.* It’s enabl[ed] us to become a completely paperless police department...All information will be in the hands of the officers, making them better equipped to protect our communities.”

This study focuses on the problem of how to enhance the situational awareness (SA) of a young soldier or marine manning a checkpoint in Iraq and how information technology (IT) might be used to help him/her better understand the regional demographic, thereby increasing the number of “bad guys” caught. The IT in question is CLEAR, a commercial-off-the-shelf (COTS) tool developed to assist the beat cop in the arrest and bookings process. CLEAR provides a rapid and accurate assessment of an individual’s information based on rudimentary biometric triggers that drive the correlation of data in an advanced data-mining tool. Data collected at the beat cop level populates a growing data universe and also drives mapping overlay capability at higher headquarters, which can be used to enable real-time, 24/7 force development decisions. Such capabilities have obvious potential for military use.

This study uses the dramatic device of *Dragnet*-style presentation to describe the journey of three National Defense University (NDU) teammates and their trials and tribulations while attempting to show DOD how CLEAR could improve the SA of troops now on the battlefield. This journey is a case study on how or how not to try to take a COTS product into DOD. The case study will review each step chronologically. It will depict successes and failures as well as roadblocks erected and overcome. It will demonstrate the inertia of the behemoth that is the Pentagon, and hint at the correctness of President Eisenhower’s warnings about the military industrial complex. In the end, it is hoped that the reader might consider what could have been done better and how the DOD system might be altered in such a way that COTS technologies can be effectively and rapidly considered. Other concepts for consideration might be how something as complex as the Pentagon’s portfolio of projects might be rapidly adjusted to take advantage of COTS projects and eliminate redundant efforts (and the associated spending) by avoiding reinvention of the wheel and instead adopting/implementing proven solutions.

The Beginning

The story of this journey begins in a seminar room at the Industrial College of the Armed Forces (ICAF), late one February afternoon. In a post-class, pre-homework lull, a single student, whom we will call Joe (Friday), industriously gathers the evening’s reading. Entering from stage left is

a second student, Bill (Gannon), an Industry Fellow with 16 years in industry, 10 of them in IT, of which the 2 at Oracle Corporation will prove to be key. Joe tells Bill of his frustrations with the inability of the Marines in Iraq to develop and maintain the necessary SA to protect and pacify a region. The factors limiting the SA were very basic: each unit was rotating too quickly through a region and was never in an area long enough to develop a sense what was in place and what was missing, and/or to develop a human network and positive rapport with the locals, which are both essential elements to “catching bad guys.”

Joe cited his months commanding a battalion in the Al Anbar province and the frequently repeated shifts in his area of operation (AO). Though other units might remain in one region for an entire tour, the number of weeks that his Marines remained in a region was at most 10—long enough to establish basic SA, but too short to exploit the advantages. This drove Joe’s seemingly rhetorical questions: How can a Marine pass SA off to another Marine? How can we shorten the time it takes for a Marine to gain strong SA? Even if a unit does remain in one location, how can we help with rapid and penetrating SA when the unit is replaced? How can we have better intel at checkpoints that will allow us to detain a suspect, understand what intel the source represents, and then exploit that intel? Joe explained that the way it is today, he could only grab someone he could confirm from a low-quality photo and, unless the suspect was a known bad guy, he had to be passed to Battalion in 18 hours, ergo no time for interrogation. By the time Battalion could confirm who a suspect was, all his associates likely had gone to ground, and any intel associated with the arrest had long since perished. What Joe thought was a rhetorical question turned out to be the beginning of the journey, for he was venting his frustrations to someone who happened to be the Industry Fellow from the IT sector and had just spent two years at Oracle.

Motivated by Joe’s question, Bill thought back to his days at Oracle. It was the focus of his consideration because he remembered a series of conversations while at Oracle about Mayor Giuliani’s use of database technology to drive down the New York City crime rate. Bill’s theory was that just as database technology was being used to drive down street and organized crime in New York (a city of five boroughs and nearly 10 million people), it could be applied in fighting insurgency, which is very similar to organized crime. As Bill researched his theory, what he found was not the New York system, but the leading edge efforts of the CPD and their system named CLEAR.

CLEAR

The Citizen and Law Enforcement Analysis Reporting System (CLEAR) is an Oracle-based system developed by the CPD. It applies an Oracle database, tools, and interfaces to create a data-mining capability for the rapid collection and assimilation of personal data associated with any party an officer must research. The gathering of the data is triggered by a biometric query, such as fingerprints or photos, and/or through scanning standard identification, such as a driver’s license. Any CPD beat cop can stop an individual of interest and, using a handheld device, access all basic personal data¹ by typing an entry, swiping a license, snapping a photo, and/or taking between one and ten finger prints. With that information gathered, the officer can launch a query from any location in Chicago and within 3–5 minutes obtain a person’s entire record: ticket history; fines; outstanding warrants; aliases; physical markings, such as tattoos or scars;

¹ The handheld device is 8.6" x 4.2" x 4.1" and weighs two pounds.

known associates; a mapping of any crimes committed, and a multitude of other essential data points. This is at the street cop level, all on the handheld device.

At the Headquarters level, the data from all interactions recorded the previous day is gathered. CLEAR generates simple daily statistics, but also correlates more complex data points that can be overlaid on a map to depict where crime seems to be waxing and waning across the city. City maps driven by the CLEAR system enable CPD leadership to rapidly assess shifts in crime patterns and enables force redeployment into areas of concern. Since this system has been in place, organized crime, gang warfare, and even basic street crime, has dropped 30 percent within Chicago. If such results can be triggered by a handheld device carried by a street cop, what could such a system do for a soldier or Marine at a checkpoint, and for the regional command structure above him?

Joe quickly saw a tool that might be of use to a lance corporal manning a checkpoint. If a young Marine was given a tool that would permit him to peer through the insular demographic within the region, might he not be able to gain game-changing SA within minutes? Would this not give him a fighting chance to catch “bad guys” who might otherwise sneak by using a disguise and false name? CLEAR looked as if it might be a potential key to enabling a squad to better control a region. At the battalion level and higher a system called BAT was already in place, but it seemed reasonable to imagine CLEAR as an extension of BAT at the squad level. The suitcase-sized BAT could remain in place to help with troops once an individual was detained, but the handheld CLEAR could help increase the number and quality of arrests and permit rapid action against accomplices based on perishable intelligence. It was this thought that triggered the creation of a few Power Point slides, and the first briefings to Bill’s professor on the U.S. Military in Transformation, Dr. Hans Binnendijk, Director of the NDU Center for Technology and National Security Policy (CTNSP).

As fate would have it, a third NDU traveler on this journey was part of Dr. Binnendijk’s CTNSP team and was researching various methods of defeating improvised explosive devices (IEDs). Frank Smith had arrived at CTNSP 6 months earlier as a Senior Research Fellow on a 2-year IPA from Northwestern University. He had extensive background in C3I systems, technology management, and entrepreneurship and was closely coupled to the intelligence community, which proved to be valuable to this effort. Furthermore, he was aware of the close involvement of one of the Centers at Northwestern in the evaluation of CLEAR for the CPD.

Over the next 3 months, the NDU trio moved quickly through a series of meetings. Their first objective was to confirm with both the CPD and warriors returning from the desert that CLEAR would fit as Joe suspected. Frank gathered information from former battalion commanders on their experiences in Iraq. Further inquiries discovered that CPD was visiting the Federal Government to discuss CLEAR at a nationwide conference of police studying law enforcement IT solutions. Similarly, Joe made contact with his old Executive Officer (XO), Major D, who was returning from a second tour in Iraq.

Lt. Jonathan Lewin of the CPD was more than happy to divert from his conference and provide a demo of the CLEAR system to the CTNSP team, and Major D was equally happy to travel to Washington to offer his assessment. What was unique about his observations was that Major

DAJ D was also a former Drug Enforcement Administration (DEA) agent who had worked undercover and also had served tours in Afghanistan leading security forces in joint operations with Afghan counter-narcotic police. He had an expert's view of security operations as a law enforcement officer, a U.S. Marine, and an Iraq/Afghanistan war veteran.

The meeting turned out not only to prove that the CPD system could execute as advertised, but completely confirmed that CLEAR would be quite applicable in Iraq and Afghanistan. Major D saw it as an important tool enabling the squad-level combatant to improve his/her SA and "stop more bad guys."

BAT

One key part of the meeting was initial discussions on capability that already existed in country, which was BAT. BAT is a Northrop Grumman proprietary product consisting of a suitcase-size biometric collection station and a custom-developed proprietary database that records basic biometrics and personal information. Due to size and operating requirements it was used at the battalion level and higher, often leaving the squad with nothing but photocopied pictures taped to pieces of cardboard. If by chance a Marine could ID a suspect against a photo, the suspect could be detained and shipped to Battalion. Once at Battalion, the suspect could have his information gathered and sent back to the United States for review. This typically took 48 hours, largely due to the architecture of the system, which required the operator to select any one of 21 databases against which to compare the information in what is called a "push" or manual system. Though this would assist in identifying bad guys, the cycle time was so long that any highly perishable intelligence that could be gathered from a suspect had often long since expired. In order for a bad guy to even arrive at Battalion for entry into BAT, he had to be detained at the squad level first, and then transported to Battalion for input into BAT. This detention-to-information cycle represents a cycle time of 60–68 hour. Without a tool like CLEAR at the squad level, the weave of the dragnet was too large, and the bad guys could slip through and their accomplices fade away.

Conversely, CLEAR applies an automated search/comparison process in a 'transactional' fashion and arrives at the same answer in 3–5 minutes. CLEAR, however, had yet to be proven in the desert. Two things BAT did have was the beginning of an Iraqi database, and a place in the operational doctrine. In theory, weaving CLEAR and BAT together might help CLEAR be more effective sooner, while BAT would get its reach extended to the squad level. At first glance, this seemed a win-win scenario.

Several issues were quickly raised about CLEAR. The concerns included: lack of communications architecture to support it in theater; vulnerability of commercial communications in an operational environment; lack of full enrollment capability; power and operating temperatures of a handheld; access and security of the device; and lack of compatibility between law enforcement and DOD databases. The NDU team examined these issues and produced an issue paper to address some of the arguments.

With this information gathered, the team's goal changed ever so slightly. Yes, they believed it was important to get CLEAR into the JRAC process, but not necessarily to replace BAT. The

goal was to perform tests to confirm that CLEAR would work in the desert, and then see how it would optimally work with BAT. If CLEAR proved better than BAT on the whole, then CLEAR could replace BAT, if CLEAR proved to have complementary capabilities while tightening the net down at the squad level, then the idea was to develop a best of breed. No matter the outcome, the key was to provide the squad-level marine the tools he/she needed as rapidly as possible.

CLEAR Costs

With the support of CTNSP and the CPD² the NDU team continued down the path. The team completed a preliminary evaluation of the costs of the CLEAR system for DOD applications. It was estimated that it would cost roughly \$3-6M for hardware and software for a CLEAR back-office system, including a license from ORACLE (if DOD architecture resembled CPD). The database technical upgrade and data migration costs would depend on hardware and architecture (1 million records/36 hours' run-time, 120 hours for analysis/translation of NG database, 120 hours' database analysts for setup and quality assurance). Furthermore, moving from proprietary software to COTS would reduce life-cycle costs by half over the life of the system. In addition, the handheld costs were estimated to be roughly \$4.2M (\$3,500/handheld unit x 1,200 users). Training costs were assumed but not estimated.

As the NDU group journeyed forward, Frank added a new member to the team, the software developer and system integrator of the biometric front end, called the MV-100. Computer Deductions Inc. (CDI) worked with the team and the CPD to establish a small test database and provided an MV-100, which enabled the team to demo the actual beat cop process and capability. Armed with this piece of equipment and a point paper stating the problem, capability, and open issues, the team began marching down a list of questions to be answered, actions to be completed, and people to be briefed. The first misstep occurred soon after—a visit from General Peter Pace, the Chairman of the Joint Chiefs of Staff (CJCS).

Every year, the CJCS visits NDU to brief the combined National War College and ICAF classes. As with all NDU speakers, there is a brief opportunity to hold short discussions with the speaker immediately before and after the presentation. As fate would have it CLEAR became a topic of the post-presentation conversation. Dr. Binnendijk led the ambush by giving the “elevator pitch.” General Pace’s reaction was positive, and he requested a copy of the materials be forwarded to his office. Before doing so, the NDU trio briefed the ICAF Commandant and Chief of Staff, gaining their support, then shipped the documents off to the CJCS. This was the moment when the snowball started to roll down the hill. Over the next few months allies and adversaries of BAT and CLEAR took sides and what was rapid progress to this point slowed down drastically.

Days after the pitch to GEN Pace, a call came in from the Office of the Vice Chairman of the Joint Chiefs of Staff (VCJCS). The CJCS had passed the documents along, and Admiral Giambastiani wanted to better understand CLEAR. Two days later, the NDU trio marched off to meet with the Admiral’s biometric team. The briefing lasted several hours, covering all aspects of the system, culminating with the VCJCS team helping with two items: the creation of a list of

² CPD offered to transfer the system to DOD while asking only for \$1 million annually to continue spiral development for themselves and to be fed back to DOD. They asked for nothing since it was regarded as their original non-recurring development costs of \$38 million.

questions that more directly represented theater strategic issues, and a directive to better understand the communications network and how CLEAR would fit into the existing theater architecture. The VCJCS team was clear that the best course of action was to take this system to the Biometric Fusion Center (BFC) and to the Army G6, which were the primary leads on biometrics. While this did represent progress, the NDU team still felt a degree of frustration because it appeared DOD was getting caught in a classic trap. Instead of realizing that the strength of the CLEAR system was the back-end software system and database processing methods, DOD was becoming focused on the “bright shiny object” that was the biometric collection kit represented by the MV-100. Instead of being labeled as an information systems project that was enabled by biometrics (which would have resided with the J-6), CLEAR was labeled a biometric system and pushed under the Army G6 and the BFC, the same organizations responsible for BAT and its evaluation.

Frustration Mounts

The trio continued to respond to almost weekly calls from the Pentagon. Conference calls with the BFC led to meetings, meetings to more open items, open items to more meetings to close items, and the snowball grew bigger and bigger. ADM Giambastiani’s staff directed BFC to conduct an evaluation of CLEAR. An engineer was sent to Illinois to learn more about CLEAR.

At this point in our drama, one would hope that Dragnet’s most famous line, “just the facts,” would be reflected in the BFC analysis, but that was not the case. The engineer visited not the CPD but the Illinois State Police, who were not on board with CLEAR and did not operate the system. After a very short visit, the BFC engineer returned and issued a report focused on the data management and its lack of application to the theater, and on potential inadequacies of the handheld unit, such as operating temperature ranges, battery life, and size of display. Though inaccurate, and based on a system he never reviewed, the report nearly killed the system for DOD, and certainly closed proper and formal channels of consideration.

The Sub Plot

As all the ups, downs, visits, calls, objectives, and achievements continued to drive the day-to-day roller coaster of CLEAR, a chance meeting occurred that set the stage for the future of CLEAR. (Chance and coincidence had truly driven CLEAR since inception.) The meeting, with former Assistant Secretary of Defense and former Marine Corps officer Bing West, became the key to CLEAR’s future within the U.S. military.

West, now an author and informal advisor to senior officers in Iraq, had been asked by the NDU faculty to co-host a 3-day event to discuss the rise of China. This placed him on campus and in the path of Joe and Bill. (West had met the two earlier in the year for a brief conversation on CLEAR at the request of Dr. Binnendijk). It happened that, as Joe and Bill ambled toward lunch in Marshall Hall they spotted a sign for an Asian Conference and walked into the nearly empty conference room to find Bing West sitting behind the audio-visual desk preparing his conference notes.

West remembered both gents, particularly Joe (as they also had met in Iraq) and after a few pleasantries asked how the “biometric thing” was going. Joe gave him the run down, including the frustrations and the high points, but more importantly on how almost all open issues had been closed, and the system appeared even more mature than originally thought. West asked for one thing—a copy of all briefings and notes. He was returning to Iraq soon and thought he might have a chance to discuss CLEAR with various leaders up to and including GEN Casey, commander of all forces in Iraq. Within a day, West had all his documents, and within a month he had lived up to his word and briefed the desert leadership.

The Urgent Needs Statement (UNS)

Though stalled by the evaluation process, the NDU team continued to try to move through formal channels to get the CLEAR system proper consideration. Slowly, it became clear that if an Urgent Needs Statement (UNS) did not exist, then the desire to pursue the effort ended with educational briefings. If CLEAR was to be tested by DOD, a UNS was the next obstacle to clear. To this end, Joe and Bill returned to the ICAF Commandant’s office for assistance. The Commandant was happy to help, but before she would initiate a UNS, she wanted confirmation that senior officers in Iraq (MG Zilmer in particular) and the Pentagon (the Director of J-6) would support it. With these marching orders, the team set about preparing briefings and the UNS.

The briefing with the Director of J-6 became a symbolic event in the journey, embodying the internal fight between allies and adversaries of CLEAR. The J-6 was a hard-driving Marine. His mission was to support the warfighter with world class IT solutions and not get bogged down in the political quagmires for which the Pentagon is famous. The meeting consisted of the J-6 Marine Director, his Deputy (U.S. Army), and three Army aides of O-4, O-5, and O-6 rank. The meeting lasted 45 minutes. Although the Director showed significant interest, his deputy indicated that BAT was in place and could be expanded to encompass similar functions as CLEAR. He noted that there were funds available to upgrade BAT with the use of a handheld device called HIIDE. He was also concerned about the communication architecture. The team agreed that this was an open issue and stayed with their goal, noting that they wished to bring the technology to the attention of leadership, get constructive direction on how problems might be overcome, and hopefully get the system tested. At the end of the meeting, the Director gave orders to “get the system tested,” and the team was directed to work with an aide.

The team returned to NDU believing they might have finally achieved their goal. The J-6 had directed that the system be tested, the ICAF Commandant’s UNS signature criteria had been met, and now a Pentagon representative would hopefully take the lead on the project. But 24 hours later, hope turned to frustration with a phone call from the aide. She said there was no reason for a test because the communication architecture in Iraq would not support CLEAR, and BAT was already present in the desert. Retorts from the team that they had confirmed that the communication architecture was, in fact, in place (Larry Wentz, a CTNSP expert recently returned from Afghanistan had confirmed it), and that BAT left the squad-level soldier with no capability had no impact.

The UNS met a similar fate. Signed by the ICAF Commandant, it was shipped off to Iraq, where USMC personnel were prepared to walk it through the ranks for signature. West had made GEN Casey aware a UNS might be coming, but it never arrived on his desk.

At this point, as befits a TV drama, all seemed lost. Our *Dragnet* trio found themselves frustrated by many people who said no for ambiguous reasons. Very few people said no for incontrovertible reasons or offered constructive criticism. The whole scenario seemed hard to comprehend: CPD had developed an anti-crime system for \$38M; the system was adaptable to counter-insurgency; it would give a young Marine at a check point a view of the insular demographic he never had before; it could lead to detaining more “bad guys” (while decreasing unnecessary detentions); it could be complementary to BAT and it could better enable leadership to make daily force deployment decisions. Furthermore, CLEAR could be fielded within months and cost DOD only about \$1M per year if DOD continued spiral development of the product for CPD as well as themselves. With Northrop Grumman about to receive millions of dollars just to bring BAT up to par with CLEAR, it was hard to fathom why CLEAR could not be funded, even as a test. What was the problem? Why was it so hard to get the system properly considered by DOD?

Naval Integrations Lab

Frank would not give up yet. He was still on the case and still determined to get CLEAR its day in court. He decided the Navy might be a better customer for this technology. He knew a former advisory board study member who was now Deputy Assistant Secretary of the Navy (DASN). He presented the capability to the Deputy for possible use in maritime interdiction operations, who put him in touch with the Director of Naval Integrations Lab (NaIL).

NaIL is a new, U.S. Navy-created lab launched in 2006. Both a PMO and a Lab, NaIL has been chartered to find COTS products that are 60–80 percent down a maturity path and can be rapidly adapted to meet Navy requirements. As both a lab and a PMO, NaIL is one of the few places that can take a project from concept to field in funding, development, testing, documentation, and associated doctrine/training/logistics planning. Though unfunded until FY07, the NaIL team was willing to review CLEAR as a possible launch project and to that end traveled to NDU for briefings. One significant factor with the NaIL leadership was its depth in IT, which enabled the team to understand that CLEAR was not a bright, shiny MV-100 biometric device, but rather any of a number of biometric collectors providing data to a mature data warehouse/data mining system. The system understanding had the NaIL team intrigued and ready to take on the CLEAR project, if not for Iraqi, at least for maritime boarding operations. Once again, the NDU trio saw funding, a potential to get the system properly tested, and a DOD organization willing to give CLEAR its day in court. All this came not a moment too soon. Graduation had arrived, and the team’s ability to have the focused attention of all three decayed to largely just that of Frank and the few spare efforts that Joe and Bill could afford.

Frank worked with a senior NaIL engineer to put together a test plan for CLEAR. In the meantime, the engineer examined the value added by this experiment, since the communication connectivity of this system already had been proven in the Navy. While it was decided that the NaIL program would not pursue this effort, the NaIL engineer personally convinced the new

Director of the BFC to reexamine CLEAR. The new Director invited Frank to Clarksburg, WV, where he spent a day working with the engineers to come up with a test plan for the system. The new Director was supportive of the concept as a complementary capability to BAT with high response times operating in the Non-Secure Internet Protocol Router (NIPR) world. Finally, BFC agreed to be a partner in an experiment. Frank had been previously introduced to the Director of the Naval Postgraduate School (NPS) effort for Tactical Network Topology (TNT) by the Chief Scientist of the Office of Naval Research (ONR). The Director of TNT agreed to conduct the experiment as part of quarterly exercises. The stage was finally set to test the system in an environment supported by Special Operations Command (SOCOM).

Theory to Practice

To this point, a CLEAR-like system that supports the arrest-to-booking process and functions as a possible enabler for the troops has been portrayed mostly in a theoretical basis. This begs the question: Can it work in practice? This question could be answered only by the real world tests the NDU team had been pursuing since day one. After much travail, they got their answer. CLEAR proved to be very effective in limited use tests. There were two such testing opportunities: one in theater and another in a field exercise operated by SOCOM-NPS.

Theater Test

As described in the February 8, 2007, *Wall Street Journal* article “Snake Eater,” a subset of the CLEAR system has seen action in Iraq, where it proved to have a direct impact on “mapping the human terrain,” as well as an enhanced psychological effect. Major Owen West, USMC, (and son of Bing West) brought an MV-100 and COPLINK loaded on a personal computer (PC) into the Khalidaya province, just north of Baghdad. According to his account to the *Wall Street Journal*, Major West and his joint U.S. and Iraqi force took the system on patrol and after one night “the town [was] abuzz.” West noted, “I think we have a chance to tip the city over now.” A rumor quickly spread that the Iraqi army was planting GPS chips in the insurgent’s thumbs. From one night of operation, not only did Major West succeed in applying the MV-100 and COPLINK, he incidentally effected a psychological operation that made the bad guys think that maybe they should find another section of the country in which to make trouble. Major West was able to build a database of the population in his AO. However, he was not able to identify the bad actors on DOD watch lists. Connectivity to DOD systems would likely provide valuable information on the insurgents in theater and exploit the more complete functionality of CLEAR.

Major West rotated home in early 2007. His replacement is continuing to employ the “Snake Eater” subset of CLEAR. On a second front, CLEAR has been field tested with complete functionality.

Field Exercise

From February 26 to March 1 at Camp Roberts, California, the architecture of the CLEAR system was tested as part of the TNT exercises. The objective of the test was to assess the ability of a CLEAR-like system (communication architecture with a layered database) to produce actionable intelligence during Marine Corps Snap Vehicle Checkpoint operations. The system was used in multiple scenarios. First, at a checkpoint manned by special operations personnel, the special CDI configured MV-100 personal digital assistant (PDA) was used to take two

fingerprints, a mug shot, and other demographic data. There were two options: Full Encounter or Fast ID. These options and configurations were the same used by Major West and his squad as part of a Transition Training Team with an Iraqi Brigade in Anbar province. In the Camp Roberts Exercise, the PDA had a limited number of records stored in the device for potential initial matching. If no match occurred, the data was sent to a High Mobility Multipurpose Wheeled Vehicle (Humvee) relay vehicle via 802.11 wireless LAN, and then transmitted to the Tactical Operations Center (TOC) via 802.16. The second match then took place at the server (laptop), which had the database of the local population. The data was then transmitted via virtual private network (VPN) to the BFC for access to the ABIS Emulator database resident in the FBI's Clarksburg center (home of IAFIS and ABIS). The Emulator database was used as a test to prove capability while protecting the security of the real ABIS. The response from the ABIS Emulator (match or no match, plus additional data) was sent back to the server at TOC. All the information was then forwarded back to the PDA for action.

The CLEAR-like system also was tested in a battlefield medical scenario and a full blue-red force scenario with checkpoint established at the desire of the TOC commander. Furthermore, it was successfully integrated to TactiComp, which was used as the relay communications from the vehicle to the TOC for the latter scenario during which the system continued to work very well. This TactiComp system is available in a number of the Humvees and is expected to be used to provide added capability to the HIIDE system (the PDA addition to BAT). The key point is that the TactiComp infrastructure is in place in the Humvee today and is a proven link for the CLEAR sub-system, obviating the need for additional equipment to be installed in already cramped vehicles.

The response times for FAST ID from data entry at the MV-100 PDA to the ABIS Emulator and back ranged from 1:28–2:47 minutes. For the Full Encounter ID, the response time ranged from 2:16–3:35 minutes. All of these measurements included the time it took to enter the data on the PDA, which ranged from 37 seconds for FAST ID to 85 seconds for Full Encounter ID. The system provided very fast response based on a single fingerprint as well as a single facial print. The special operations personnel took these measurements at the checkpoint and provided valuable feedback.

The significant advantage of the CLEAR-like system is that it does not require Secret Internet Protocol Router Network (SIPR) access; therefore, it can be left with coalition partners without concern over security. Eventually, this system can be made complementary to the existing BAT system with its SIPR connectivity and database, expanding capability for U.S. forces through a simple connectivity integration, while retaining unclassified capability for allied forces or members of the law enforcement community who do not have SIPR access. This will work to incorporate the existing databases into one overall integrated architecture, which may be able to provide solutions to both a squad level soldier and beat level police officer as each attempt to “protect and serve.”

The Next Steps

Frank was finally able to receive limited funding from the Director of Research and Research Training Office (RRTO) in the Office of the Secretary of Defense (OSD) to conduct additional

tests. The next tests are at a Maritime Interdiction Operation (MIO) exercise in San Francisco and a more comprehensive test of the ground environment at Camp Dawson, West Virginia. These tests will use theater communications capability and link CLEAR to the DOD ABIS system. In the meantime, the NDU team is trying to figure out how to go about introducing this capability to theater. The team will not rest until this system has been added to theater and is adopted, even though there are extensive plans and funding plus-ups to improve the capability of the existing system.

Unlike Dragnet, this story does not end with “fade to black” preceded by telling comments by Detectives Friday and Gannon. Instead, the tale halts with the team still working through real world testing. As of this writing, the most encouraging news is that more “in theater” testing is being discussed, but the conclusion of this story remains as much a mystery to the authors as to the readers. For the foreseeable future, the saga continues. Will CLEAR be tied to BAT? Will the war fighter get a CLEAR-like system as an SA enabler? Will the BAT vendor get money to recreate that which already exists? Tune in next time for the continuing adventures of CLEAR and DOD.

Instructors Guide to CLEAR Case Study

The Dragnet case study focuses on the attempt to promote a COTS concept into DOD. The key to the concept is that a team from NDU, through a series of chance occurrences, recognized an essential need of the war fighters in Iraq and discovered a strong potential solution from the streets of Chicago. The team's sole intent was to present a mature idea to the Pentagon leadership so the concept could be reviewed and properly tested. They never intended to become product representatives nor to receive compensation for their efforts. The goal was to get a proper consideration of a cost-effective, rapidly implementable, and proven technology into the hands of squad members in Iraq, enabling them to more rapidly and accurately execute their mission.

Over the course of the efforts, various obstacles were encountered and overcome. The potential for a rapidly evaluated field solution was lost, and testing continues to drag on. The essential takeaway from this lesson should be for the student to think about how to take a solid concept into DOD to support rapid and proper evaluation as opposed to getting caught in a long dragged out process which sub-optimizes time and dollars and does not get the war fighter a solution. Below are a few questions that can be used to help initiate conversation.

Question 1: What did the NDU team do right and what did they do wrong?

The team took a "bottoms up approach" to the problem. They determined the need and researched the existing community for solutions to the problem. After researching and narrowing the solution to one that represents a commercial-best-practice, they confirmed it would indeed fit into the warfighters' needs. As to what they did right, they thoroughly reviewed the problem, the solution, and the fit between the two with experts from the field.

What they did wrong was enter the rapid acquisition chain improperly. While the team originally saw this as a chance to recommend solutions to DOD and allow someone to drive them internally, the team instead got caught up "representing" and championing the product. This reactive strategy never permitted them the opportunity to step back and enter the JRAC or REF through proper channels.

Question 2: How could the JRAC or other acquisition processes have been used to achieve the team's goals?

Reviewing UNS would dictate short-term demand, where the Joint Capabilities Integration and Development Process (JCID) and particularly the Joint Capabilities Document (JCD) could have been used to reflect longer-term demand. Closer review of current UNS, the JCIDS, and particularly the JCD might have helped paint a picture for possible points of entry into the acquisition system. Students should consider these items in concert and discuss how a COTS solution can most optimally enter the system.

Question 3: How can DOD efficiently replace items in the current portfolio without severely impacting budgets or careers?

Under Secretary of Defense for Acquisition, Technology and Logistics (ATL) Krieg noted in a speech to the New York financial community that he has a vast portfolio of products moving through the acquisitions process. Though many are well along in the process Secretary Kenneth J. Krieg commented that he was always open to reevaluating and replacing items in the portfolio if they could help meet the war fighters needs more immediately. DOD has thousands of items moving through its acquisition portfolio on a constant basis. Many of these items are moving through a minimum of 3 years as dictated by the budget cycle and associated development time lines. Yet, in areas driven by IT, as Moore's law describes, more advanced products come available every 18 months. To exploit the new technologies while optimizing the spend against items in the portfolio, DOD would need a method of tracking, evaluating, and replacing items within the portfolio without sub-optimizing current investment. Add to this that many projects, such as BAT, have gained a certain level of career-based inertia similar to what the commercial world calls the not-invented-here syndrome. Is it possible for DOD to emulate commercial efforts and more rapidly re-prioritize portfolio items, or is the inertia too high and the process too onerous?

Question 4: One tactic the team never applied was the use of Capitol Hill, Industry lobbyists, and/or the media. How might this have hurt or helped getting the CLEAR system properly evaluated?

Various combinations of Capitol Hill pressure, industry lobbying, and media exposure have been used to help push through systems that have been delayed, stalled, or even cancelled by DOD. Systems as large as the V-22, as sensitive as the Trophy System, or as visible as the M-4/HK 416 have all been stopped by DOD, but Congressional pressure, frequently in coordination with lobbies and in conjunction with the media, has restored these programs. These efforts are often initiated by the company or companies that produce the product in question with the end game of forcing product into DOD and "keeping jobs" in specific political districts.

In regard to CLEAR, such action was never taken. If the team had pursued this course of action, the logical step would have been to engage with two of the best known firms in the United States: General Electric (GE) and Oracle. GE owns Cross Match Technologies, which manufactures the MV-100 collection device, and Oracle Corporation provides the software on which CLEAR runs—from the database to the developer and data-mining tools. Add to this the City of Chicago, which also stands to gain both high-tech jobs and spiral development funding from DOD, and you have three very powerful lobbies. Further motivation for these entities is that the system selected by DOD would have an increased chance of becoming a nation-wide system through the Department of Homeland Security (DHS). An example is Northrop Grumman's success in taking BAT into the U.S. Postal Service and the U.S. Citizenship and Immigration Services (CIS). Winning a DOD contract would be just the tip of the revenue iceberg.

As is evidenced by the systems mentioned above, such powerful lobbies can help break through parochial interests and even proper process and get attention focused on a particular product. In the case of the Trophy system, such pressure revealed DOD evaluation teams being composed of 2/3 contractors and 1/3 DOD personnel. Of the contractor personnel, the majority were also involved with the research and development (R&D) on the competitor product being developed

by a U.S. provider—a massive conflict of interest. In this case, Congressional oversight preformed as chartered.

With that in mind, the risks and rewards of engaging powerful lobbies, corporate America, and Congress need to be carefully measured against the desired strategic outcome for a product. As the outcome for CLEAR is still unknown, this capability could be called into play, though not by CTNSP.