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RAPID FIELDING

From its inception, the HSCB Modeling Program has focused on developing near-term capabilities for warfighters and other users while seeding longer-term investments and leveraging the basic and applied efforts of other organizations (e.g., Minerva). To that end, we have led the way in the rapid fielding of sociocultural behavior technologies and as a result, excellent sociocultural technologies and programs are being used to meet the needs of operators and analysts as tools for sensing changes in the sociocultural environment. Sociocultural behavior technologies can be used to simply detect and monitor the environment, provide indications and warning, and contribute key human condition characteristics to the common operating picture (COP) in the full range of military operations. There are demonstrable successes such as the Worldwide Integrated Crisis Early Warning System (W-ICEWS) being used to provide General Fraser his Intelligence, Surveillance, and Reconnaissance (ISR) in the U.S. Southern Command Area of Responsibility (AOR); a Civil Information Management capability informing the COP for the U.S. Marine Corp (USMC) during Humanitarian and Disaster Relief (HADR) exercises in the U.S. Pacific Command AOR; and the Planning Research and Intelligence Scalable Modeling (PRISM) prototype providing advanced trends and visualizations of sociocultural data for planning.

The HSCB Program is also building precursor and stand-alone technologies and algorithms in many other projects that will yield better operational technology in the next two to five years. Increasingly, these technologies are now being defined as providing key layers and analytics as part of standard ISR and the program's technologies are being used as a type of sociocultural warning system. These emerging uses are very exciting and are precisely aligned with administration and DoD priorities to develop technologies that enhance understanding and dialogue with external audiences.

However, it is challenging to build, transition, and field systems of any type. Rapid prototyping demands a commitment of money, staff, and time that many programs simply cannot afford or for which they lack the authority. The HSCB

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WELCOME

Welcome to the twelfth edition of the HSCB newsletter. In this issue we devote particular attention to the program's considerable success in transitioning technologies and other resources to end users. The program has supported a number of projects that have transitioned into tools for our deployed warfighters and programs of record (PORs). In this issue we discuss the importance of transition and the process that our awardees go through to ensure that their research responds to user needs and will yield tools that can be integrated and sustained by PORs. In a related article, we provide examples of transition partners that the program has supported in the last two years.

The HSCB Program is a leader within the Department of Defense in the rapid fielding of emerging technologies. An article discusses the challenges associated with rapid fielding and highlights some key successes of the HSCB Program. We also offer a primer on the structure of Research, Development, Testing and Evaluation (RDT&E) funding, with particular focus on the importance of advanced component development and prototypes (6.4) funding to the HSCB Program.

With the wide variety of formats, storage, and collection currently used in the world, reconciling highly disparate data on sociocultural behavior presents one of the hardest challenges to any technological approach to problem solving. The HSCB Program is meeting this challenge both by coordinating work between funding recipients and by assisting these recipients to transition their systems to PORs. An article discusses the challenges of data and data management, and how the HSCB Program will continue to work with different performers and transition partners to optimize our effectiveness. HSCB strives to demonstrate useful, mission-focused, end-to-end systems that can integrate sociocultural indicators at scale and provide decision support that allows analysts to drill down to source data. For example, MITRE's Social Radar program uses traditional data sources, news, blogs, and social media to facilitate analyst understanding of events on the ground.

While looking to the future, the HSCB Program has also focused on delivering useful solutions to our warfighters today. Research teams from Lockheed Martin's Worldwide Integrated Crisis Early Warning System (W-ICEWS), Army Geospatial Center's International Stability Assessment and Analysis Capability (ISAAC) software, and Social Network Analysis Reachback Capability (SNARC), which provided support directly to analysts deployed to Afghanistan, have already delivered tools and support directly to our warfighters. This month we spotlight two of our other promising performers: GeoEye Analytics, which is developing a technique for unbiased analysis of different data types, and Dr. Mansoor Moaddel of Eastern Michigan University, who is using survey and demographic data to understand key shifts in the world, including a shift in some countries toward secular politics and weakening support for implementing sharia law.

I would also like to take this opportunity to remind our readers that the HSCB Modeling Program will not host the Focus 2012 meeting. However, many HSCB research teams and program staff will lead sessions and present their work at the Applied Human Factors and Ergonomics (AHFE) Cross-Cultural Decision Making conference. This meeting, to be held at the Hilton San Francisco Union Square from July 21–25, will be the primary event for defense-oriented sociocultural research and engineering in 2012. Although submissions for regular presentations are closed, it is still possible to submit proposals for poster sessions. Attendee registration for this event is open, and we hope to see you there. For more information, please go to http://www.ahfe2012.org/CCDM.html.

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Social Media in HSCB

By CAPT Dylan Schmorrow

Social media is an increasingly important mechanism for conducting personal, business, and governmental communications. Facebook, YouTube, Twitter and other leading tools have become standard elements of the communication strategies and tactics of individuals, groups, organizations, and nations. Much has been alleged about the impact of these tools on behavior, as in the North African uprisings often referred to as the "Arab Spring." The factors that drive national-scale change do not arise overnight, nor are they caused or created by Facebook or other social media applications. Yet it seems that the structure and content of large-scale communication matters a great deal in the months or years preceding social unrest, as that unrest unfolds, and in its aftermath. Such communication also seems to be a very important component of the growth of networks, including those that enable violent extremism.

While social media form is important, it is also highly fluid; the technologies and applications associated with social media mutate rapidly, challenging anyone's ability to isolate and specify the medium's impacts. Research on the nature of social media and its consequences for geopolitically-relevant behavior is essential. Those responsible for U.S. national security must support such research if the nation and Department of Defense (DoD) are to constructively engage in this medium. We must understand the mechanism of such communication, the relationship between what is said online and what occurs in the physical world, the issues associated with data scale, and the data itself.

The HSCB Modeling Program was created to optimize our defense forces' abilities to forecast behaviors driven by social and cultural variables and take effective courses of action in the full range of military operations. The program specializes in research and engineering of methods, tools, and systems centered on computational models. These approaches offer innovative ways to tackle the complexity inherent to sociocultural behavior at scale. At present, several HSCB projects are tackling tough questions associated with social media, including:

- Does social media data (especially when combined with other data) have value for monitoring and predicting foreign instability events?
- Can such data be used to detect early indicators of violent extremism and mitigate its spread?
- Can survey results based on social media serve as proxies for the results of conventional polling?
- How can social media be used to understand and model the effectiveness of U.S. engagement with foreign populations?
- What narratives drive behavior, can they be detected in social media, and how can the U.S. use narratives to be more effective in its strategic communication?
- How can we most effectively blend hard and soft power to prevent or shorten armed conflict?
- What makes one idea spread rapidly across social networks, while another fades quickly?

The HSCB Modeling Program focuses on modeling, and social media data and technologies are one small aspect of what we are doing. HSCB is developing technologies that can provide understanding and some warning when things start changing rapidly in the world. It provides a vital hedge against the unconventional challenges of irregular warfare, violent extremism, nation-state instability, and other challenges.

Rapid Fielding

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Program has the funding and authority, along with the technically and operationally focused staff needed to make rapid fielding happen.

From projects such as the Social Network Analysis Reachback Capability (SNARC), which received an award from MG Flynn for support to our forces in Afghanistan, to our projects in support of U.S. Strategic Command (USSTRATCOM), U.S. Africa Command (USAFRICOM), U.S. European Command (USEUCOM), U.S. Pacific Command (USPACOM), U.S. Army Training and Doctrine Command (TRADOC) Analysis Center, and others, HSCB remains strongly focused on the needs of the users and builds systems to meet those needs.

The HSCB Program works to ensure that developments and projects from many of the well-known applied and basic research programs can be seamlessly integrated into operational capabilities such as PRISM and ISPAN's GAP-CIE. That will indeed yield significant benefits to the warfighter in the future. Simply put, it takes all forms of research to build useful capability and HSCB has the variety of funding types necessary to research and build warfighter-relevant systems and to have the lead in the rapid fielding of capabilities. From the Combatant Commanders down throughout the forces, users want sociocultural ISR and Indications and Warning (I&W). Thanks to the outstanding work done by HSCB Program performers, that is what we are delivering and will continue to deliver.

HSCB Modeling Program Takes on Tough New Data Challenges

The HSCB Modeling Program is taking on tough new data challenges. For example, unanticipated social events such as the Arab Spring have corollary and perhaps precursor indicators in online sources, including blogs and social media. If systematically monitored, these sources could provide warning prior to these events. The driving questions for using these new data sources include:

- What indicators should we monitor?
- When are the indicators observable?
- What are the "tipping points" for given indicators?
- How do indicators change over time?
- How can we generalize across other countries and regions?
- How can we integrate the new data sources with traditional data sources?

The HSCB Modeling Program is striving to demonstrate useful, mission-focused, end-to-end systems that can integrate sociocultural indicators at scale and provide decision support that allows analysts to drill down to source data. For example, MITRE's work in Social Radar uses traditional data sources, news, blogs, and social media to facilitate analyst understanding of what is happening on the ground. Our goal is to give analysts access to representative data in near-real time, as well as tools that support alerts. These environments allow analysts to explore data, perform diverse analyses (tools, models, and forecasts), generate products for decision-makers, and help communicate analyses through tailored dashboards that support drilldown and knowledge management.

Since Social Radar is built to the Distributed Common Ground System (DCGS) Ozone Widget Framework, it is an enterprise-focused testbed for early transition of sociocultural tools. However, it is not the only system taking on tough new data challenges. The Worldwide Integrated Crisis Early Warning System (W-ICEWS) and Planning Research and Intelligence Scalable Modeling (PRISM) are other excellent examples of systems that allow the analyst to explore data, create forecasts, and perform diverse assessments.

These mature, end-to-end, data-to-decision support systems are being built to enable analysts to tailor and weight the fusion of indicators, use online sources to update model parameters, use course of action models to provide quantitative evidence for indicator integration strategies on model outcomes, etc. Since these systems take a data-to-decision support perspective—using social media-based indicators with simulation models—they require an analysis environment that supports the development of **common output measures, management of uncertainty analyses, and model validation**. Incorporating these three elements from the start ensures that the HSCB Modeling Program is truly addressing the most significant challenges to warfighter use of sociocultural data and tools.

Transitioning HSCB Technologies

The Office of the Assistant Secretary of Defense for Research and Engineering (ASD(R&E)) emphasizes the importance of delivering innovative technology to support the warfighter. As a major initiative of ASD(R&E), the HSCB Modeling Program recognizes that the "R" in "R&E" is only half of that transition equation. The "E" involves integrating the theory-based research we perform into engineering solutions usable by operational partners.

For the HSCB Program, transition can follow several paths, with the most desirable being transition to a Program of Record (POR). PORs have the benefit of explicitly defined requirements, an existing user community, a target architecture, and planned multi-year funding. An operational organization with these same characteristics is also a viable transition partner because, when combined, these elements ensure that an HSCB-funded technology accepted for transition will provide valuable capabilities now and for years to come.

The HSCB Program considers multiple factors when planning a transition. Primary among them are the need for the sociocultural behavior capability and the desire to maintain the provided capability into the future. Consequently, we take great care to ensure candidate technologies fit the capability needs of our partners' user communities. Often requirements are broadly written, making it important to work with the end-users to understand the details of their work and their processes. The HSCB Program has found that making sure the technology is compatible with the user's existing business processes is critical for acceptance.

Technology integration is an obvious consideration when partnering with a POR or organization. The HSCB Program must understand and often tailor its technologies to the target architectures, hardware, and software choices that the partner has selected. We must also understand the partner's acquisition realities and processes. As mentioned in the Rapid Fielding article, we are leading the rapid fielding of capabilities in the sociocultural behavior domain. This has occurred, in part, because we work to create lasting partnerships that will allow HSCB to deliver needed sociocultural behavior capabilities to the right end-users. Creating trust and maintaining a reputation for quality technical work are key to achieving this goal.

In just this past year, the HSCB Program has had significant success in developing partnerships and transitioning technologies across a range of PORs and organizations. We entered into formal partnership agreements with the Army TRADOC Analysis Center (TRAC), the U.S. Strategic Command's Integrated Strategic Planning and Analysis Network (ISPAN) POR, and U.S. Africa Command's

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Transitioning HSCB Technologies

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Intelligence Knowledge Development (IKD/J2). For FY12, we have commitments to add a U.S. Special Operations Command element, the Marine Corps Civil Information Management (MARCIM) POR, the Air Force Targeting Center (AFTC), and U.S. Africa Command J3. We directly supported the warfighter and DoD efforts to counter violent extremism through the SNARC project, and we will deliver the PRISM Hybrid Socio-Cultural Modeling System to U.S. Special Operations Command. We also participated in COBRA GOLD 2011 to demonstrate the capabilities and readiness of ISAAC. This, along with two other HSCB-funded technologies, will be fielded as foundational capabilities in the Marine Corps' new MARCIM POR. Another project of impact was our work with U.S. European Command J2/Deep. All of these projects are described later in this issue.

As these successes and ongoing activities demonstrate, transition is a key component of the HSCB Program's mission. We approach it with care and the knowledge that we are building long-term partnerships for ASD(R&E) and are the vanguard for introducing sociocultural behavior capabilities into our partners' contexts. We focus on good science, sound engineering, and acquisition realities to make our partners and, by extension, the HSCB Program, as successful in their missions as possible.

Transition Programs

W-ICEWS

The Worldwide Integrated Crisis Early Warning System (W-ICEWS) provides planners with sociocultural modeling technologies relevant to monitoring, assessing, and forecasting the occurrence and evolution of instability events throughout the world. W-ICEWS places specific emphasis on situational awareness, thereby alerting users to the need to update deliberate planning products, trigger crisis action planning, and conduct post-execution analysis. W-ICEWS technology has been fielded at the two major COCOMS starting in 2010. The W-ICEWS technology will be fielded for operational users worldwide later this year.

PRISM

The HSCB Program is supporting Global Planning Assessment (GPA) processes as well by providing sentiment analysis, instability modeling, and exploitation of native-language sources to create empirically and theoretically sound hybrid models and tools that answer "what-is" and "what-if" questions for analysts and planners. Planning Research and Intelligence Scalable Modeling (PRISM) leverages prior DoD technology investments to provide analytic and visualization tools for analytic products. PRISM also captures best practices for use in planning, assessments and potentially in other analysis and operations units.

MARCIM

Persistent, actionable knowledge of the battle space is a key enabler of effective Civil-Military Operations (CMO). U.S. Marine Corps (USMC) Civil Affairs (CA) teams engage in CMO, but they need to enhance their ability to efficiently share and analyze the critical information and experiences they collect during their engagements within the civilian environment. To fill this gap, the USMC Civil Information Management (MARCIM) system provides USMC users the ability to quickly report the status of CA projects, compile and display mission data, perform sociocultural analysis, and build models and tools for use in accomplishing CMO missions. MARCIM leverages innovations in mobile computing technologies, semantic information and knowledge management, and Web-based geospatial decision support capabilities to form a modular set of capabilities that can be deployed as components or as an end-to-end system.

The HSCB Program has been working with MARCIM to integrate Milcord's Semantic Wiki and the Army Geospatial Center's International Stability Assessment and Analysis Capability (ISAAC) tool.

- **Milcord's Semantic Wiki:** This wiki is a knowledge portal for Civil Information Management (CIM) that enables users to collect, organize, tag, search, browse, visualize, and share structured CIM knowledge. A semantic wiki differs from a regular wiki (such as Wikipedia) in that it uses a knowledge model that captures and identifies relationships within and between pages.
- **Army Geospatial Center's ISAAC:** ISAAC provides an interoperable framework for information sharing and decision support by developing smartphone applications (Android, iOS). The framework supports such functions as performing field assessments of humanitarian assistance and disaster relief conditions; managing a scalable central data repository for storing and disseminating field-collected and supporting datasets; providing a common decision support interface where users can visualize field-collected data with overlays of imagery, external Web feeds (such as weather, natural hazards, and social media), and background sociocultural and economic data; and performing geospatial analysis on field-collected and background datasets. Since ISAAC can be deployed on both local and cloud-based servers, users only need a Web browser to access these capabilities.

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Transition Programs

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U.S. Africa Command J2

As a proof- of- concept requested by U.S. Africa Command (AFRICOM), HSCB performer GeoEye Analytics applied two geospatial modeling tools to the activities of the Lord's Resistance Army (LRA) and associated Internally Displaced Person camps in central Africa. The first tool, AnthroMapper, is an ArcMap extension that uses terrain and population density information to identify geospatial regions which could contain family or tribal groups, and then maps those regions to particular groups based on known point locations. The other tool, Signature Analyst (SA), examines the relationships between historic locations for an activity or entity of interest and geospatial data layers that represent such environmental factors as natural terrain, human infrastructure, and demographics. These statistical relationships form a geospatial "signature" of the activity or entity of interest that can be applied across an area of interest to identify unknown locations where that activity or entity is likely to occur. SA also identifies the environmental layers that contribute most strongly to determining likely locations for an activity, providing input to decision-makers who may need or want to influence that activity. Identifying the most likely locations for new violence and the environmental factors that support or mitigate it provides valuable insights to AFRICOM, local governments, and non-governmental organizations.

U.S. European Command J2/ Deep Futures

GeoEye Analytics also conducted a pattern analysis of North African and Turkish migration to France and identified destinations with similar characteristics within the greater European Union. Analysis of 120 factors focused on economics, social services, and infrastructure helped map migrants' possible selection of destinations. Understanding the factors and resulting migration patterns provides valuable insight to U.S. European Command and local governments on possible emerging challenges.

Army TRADOC Analysis Center (TRAC)

The HSCB Program has been working with TRAC to integrate two tools – the University of California at Davis's Semi Automated Force (SAF) and Charles River Analytics' Military Information Support Operations (MISO) Planner – into TRAC's Irregular Warfare Tactical War Game (IW TWG). The IW TWG is implemented as a composite of tool modules whose input includes the state of the operational environment and output includes perceptions of the population and key individuals. These provide intermediate metrics in the political, military, economic, social, infrastructure and information (PMESII) spectrum that players can use as indicators of success.

- **University of California at Davis Semi-Automated Force (SAF):** The SAF tool uses historical data on the players, including standard operating procedures, commander's preference for kinetic versus non-kinetic tasks, and commander's tempo preference for the given week. Input data includes all players' executed (known) tasks, the red players' scheduled (intended) tasks, the population's observed attitudes, behavior, population density (by zone), and other factors to produce a list of predicted tasks for red to implement in the following week. In short, the SAF tool speeds up task selection to allow more time for planning.
- **Charles River Analytics' Military Information Support Operations (MISO) Planner:** The MISO Planner uses data from the cultural geography model and the total list of scenario events generated by all player tasks to evaluate which Information Operations (IO) messages would be most effective across the demographic groupings. The commander then selects the message that has the greatest effectiveness for the demographic he wishes to reach; selects the means of delivery (leaflet, radio, or poster); and, taking resource limitations into account, produces a list of zones where the message should be delivered and designates the date of delivery and the quantity. The output is a single-page printout showing MISO tasks allocated to each unit, including the message to deliver, the means of delivery, and the delivery zones.

Air Force Targeting Center (AFTC)

In partnership with the AFTC, the HSCB Modeling Program will develop operationally relevant mechanisms for suggesting and assessing the potential impacts of non-kinetic targeting actions. This is a new project in FY12. The overall vision incorporates agent-based modeling tools for Course of Action (COA) planning and text-based analysis for "battle damage assessment" of the non-kinetic measures selected. AFTC will serve as an operational sponsor for the University of Chicago's Modeling Strategic Contexts project, which provides strategic-level models of alliances and sub-national group dynamics. AFTC will also provide operational use cases for the new Perceptronics Enhanced COA Analysis by Integration of Decision and Social Influence Modeling with Multi-Agent System Technology (CADSIM) effort, a multi-agent COA tool, and will use the W-ICEWS sentiment analysis and trend recognition capabilities (iSENT and iTRACE respectively) to gauge the effects of the Air Force's influence actions.

- **University of Chicago:** The University of Chicago is building a theoretically shaped and empirically grounded computational model of strategic contexts that can be used to explore emergent initiatives, campaigns, scenarios, and policy outcomes. The Modeling Strategic Contexts project does this by providing methods and tools for the analysis of international conflicts. The tools use interactive constraints and affordances by which competing initiatives and campaigns are forged. Specifically, the project has delivered

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Transition Programs

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a prototype "gaming engine," training modules, and the underlying computational social theory.

- **CADSIM:** Perceptronics Solutions, Inc. is developing a toolset for "Enhanced COA Analysis by Integration of Decision and Social Influence Modeling with Multi-Agent System Technology (CADSIM)." Upon completion, the project will give commanders and their staff capabilities for analyzing the impact of sociocultural factors in determining optimal COAs for a variety of today's operations. By combining advanced social science theory with decision-analytical methodology and multi-agent system computations, the CADSIM framework will allow planners to identify critical points of social interaction as well as the likely influence of nth-order communication effects on COA outcomes. A major challenge and focus of Perceptronics research will be adapting Social Influence Network Theory to enable valid predictions in the military operational environment, and in particular to allow commanders to model the evolution of beliefs, attitudes, behaviors, and allegiances in complex, cross-cultural environments.

Coordination Efforts of the HSCB Modeling Program

The sociocultural behavior research and engineering (SBRE) community is diverse and broad, including researchers, operational end-users, and leaders from across the Department of Defense (DoD), Interagency, and Intelligence Communities. A recently published paper authored by CAPT Dylan Schmorrow, *Sociocultural Behavior Research in the DoD Context*, highlights the current foci and challenges of this group. To access this paper and learn more about this community and its vision for the future, visit http://*www.dtic.mil/dtic/tr/fulltext/u2/a549230.pdf*.

The HSCB Program, a member of this SBRE community, coordinates with other community members to ensure that the program effectively identifies and meets end-user needs. The program hosts outreach-oriented events and publishes this quarterly newsletter to provide a forum through which researchers, developers, operators, end-users, and potential transition partners can be made aware of each other's requirements. Program updates and products are regularly shared throughout the year and are disseminated to the program managers and key staff of all relevant organizations. Specifically, HSCB works with the DoD community on long-term portfolio development through Broad Agency Announcement (BAA) development and review, research proposal selection, and programmatic review of funded efforts. Involving members of the broad SBRE community in program responsibilities and program development efforts reduces the potential for duplication of research efforts, allows each program to better understand the others' foci, and ensures that current and emerging challenges are addressed with the most efficient use of resources.

In addition to these types of coordinating efforts, the HSCB Program uses the Human Systems Community of Interest, the Irregular Warfare Modeling and Simulation Senior Coordinating Group (IW M&S SCG), and the Defense Intelligence Socio-Cultural Capabilities Council (DISCCC) as vehicles for cross-pollination of ideas. These three vehicles, as well as specific coordination with each of the Services and Combatant Commands (COCOMs), ensure that the HSCB Modeling Program meets current and future customer needs.

The Human Systems Community of Interest (HS CoI) is a DoD Senior Executive Service-level coordination group formed under the auspices of the DoD Science and Technology Executive Committee. The HS CoI members represent leading research areas oriented to Human Systems Integration, including Human System Readiness, Human Centered Autonomy, Human Interface to Cyberspace, Human Resilience, Neuroscience, the Sociocultural Sciences, and other related areas. The HS CoI serves as a key link to other DoD CoIs and supports increased outreach for international cooperation.

The mission of the **Irregular Warfare Modeling and Simulation Senior Coordinating Group (IW M&S SCG)** is to enhance visibility, collaboration, and coordination of IW M&S across DoD. Activities include assessing IW M&S capabilities; identifying potential gaps, solutions, and metrics for IW M&S; producing reusable IW M&S that provides common solutions; and leveraging existing investments in M&S. The group holds monthly meetings attended by 18 leaders at the Flag Officer/General Officer level who represent the Services, Joint Staff, COCOMs, Office of the Secretary of Defense (OSD), and the Under Secretaries of Defense (USDs)—all potential end-users for the products developed by ASD(R&E) and the Office of the Under Secretary of Defense for Intelligence (OUSD(I)).

The Defense Intelligence Socio-Cultural Capabilities Council (DISCCC) is chartered and chaired by OUSD(I). This working group pursues the establishment of sociocultural capabilities that meet the requirements of commanders, staff, and policymakers at all levels of DoD. Its work supports the development, use, and institutionalization of sociocultural knowledge, concepts, methods, analysis, and tools throughout the Defense Intelligence Enterprise (DIE), as well as in the missions of DISCCC member organizations. DISCCC standing membership is composed of those organizations within the DIE responsible for the management or use of sociocultural capabilities that inform the decision-making of senior leaders. Enabling objectives include coordination of capability development, operational collaboration, and institutionalization of sociocultural capabilities. Participants include groups whose R&E activities are directly tied to the requirements of DISCCC member organizations.

What Do the Arab People Want?

Comparative Project on Religious Fundamentalism in the Middle East

Dr. Mansoor Moaddel

In this article I will discuss the Arab Spring and its probable future in light of the findings from our project's comparative national surveys carried out in Egypt, Iraq, Lebanon, and Saudi Arabia last year. Funded by the HSCB Modeling Program, this project's goals include understanding religious fundamentalism, trends in values, and attitudes toward Westernization and violence.

In contrast to the backdrop of radical Islamism, the surveys we conducted showed that 84% of Egyptians and 66% of Lebanese regarded democracy and economic prosperity as the Arab Spring's goal. In both countries, only about 9% believed that these movements aimed to establish an Islamic government (see the figure below).

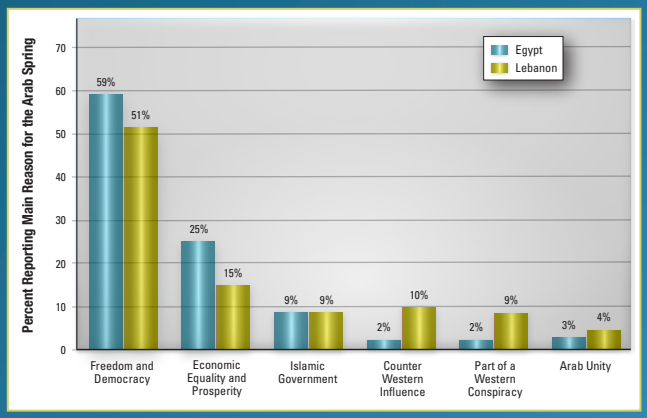

Figure 1. Percent Egyptians and Lebanese indicating the goals of the Arab Spring (sample size: 3,500 for Egypt and 3,000 for Lebanon)

For Egypt, Iraq, and Saudi Arabia, the Arab Spring reflected a significant shift in people's values. In 2001, only 8% of Egyptians defined themselves primarily as Egyptians, while 81% defined themselves as Muslims. In the wake of the Arab Spring, however, these numbers changed dramatically: those defining themselves primarily as Egyptians rose to 50%, while those defining themselves as Muslims dropped to 48%. Among Iraqis, self-identification as Iraqis jumped from 23% of respondents in 2004 to 57% in 2011. Among Saudis, the figure rose from 17% in 2003 to 46% in 2011, while the share of those asserting a primary Muslim identity dropped from 75% to 44%.

There has also been a shift toward secular politics and weakening support for implementing sharia. Among Iraqis, the percentage of those who agreed that Iraq would be a better place if religion and politics were separated increased from 50% in 2004 to almost 70% in 2011. Although we do not have the same data for Egypt and Saudi Arabia, both countries show a decline in support for sharia. In Egypt, those considering it "very important" for government to implement sharia declined from 48% in 2001 to 28% in 2011. For Saudis, the figure fell from 69% in 2003 to 31% to 2011.

Finally, an analysis of a nationally representative sample of 3,500 Egyptian adults showed that participants in the anti-Mubarak movement were more likely to be younger single males with higher socioeconomic status, users of the Internet, newspaper readers, urban residents, and believers in modern values and free will. They did not mind having Americans, British, or French as neighbors. Religiosity did not predict participation, while religious intolerance reduced participation.

These figures seem at odds with the results of Egypt's recent parliamentary election, in which the Muslim Brothers and the Salafi fundamentalists together received about 70% of the vote. It remains true that religion is important for Egyptians, as 66% of those surveyed "strongly agree" or "agree" that it would be better if people with strong religious faith held public office, and 57% consider a government's implementation of sharia "very important" or "important." However, 78% agreed with the statement that it would be better if more people with a strong commitment to national interests rather than with strong religious views held public office.

How, then, to explain these inconsistencies? First, the religious groups, the Muslim Brothers, in particular, benefited from years of political activism, and thus were better able to mobilize their supporters, whereas the liberals, who led the uprising against the former regime, lacked nationwide organization and had little time to translate their newly acquired political capital into votes.

Second, the liberals' priorities were misplaced. Instead of advancing their agenda among Egyptians, they focused on the wrong enemy, spending invaluable time organizing rallies against the army.

Finally, the election outcome is not as bad as it appears. Liberalism has been under continuous attack for decades from religious extremists, and liberal organizations were stifled by oppressive rules. If the Mubarak regime had fallen under the banner of political Islam, Muslim fundamentalists would have been in a much better position to advance more exclusivist claims over the revolution and the country. But it was the liberals who delivered Egypt from authoritarianism. This, in turn, brought legitimacy to liberalism and generated the powerful feeling of nationalist awareness among Egyptians. As a result, support for sharia declined and national identity soared. Insofar as political discourse is focused on national rebuilding and freedom, Islamic fundamentalists, in Egypt and elsewhere, will face an uphill battle.

More data are necessary for a better understanding of the process of change in the Arab world. Given that the Arab Spring caught observers by surprise, the findings from our comparative values surveys may be useful in formulating a sound diplomacy toward Arab countries that serves both U.S. national interests and peace in the region.

Pattern Analysis of the Lord's Resistance Army and Internally Displaced Persons

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In many locations around the world – particularly Africa – violence, disease, famine, and other natural disasters are forcing people out of their homelands. These involuntary migrants, whether internally displaced persons (IDPs) or refugees, often reside in "temporary" camps in close proximity to criminal or terrorist groups or to people with violently opposed religious or cultural beliefs. Identifying the most likely locations for new violence and the factors within the local environment that enable or mitigate it provides valuable insight to U.S. forces and organizations, local governments, and non-governmental organizations (NGOs) serving these populations.

The Lord's Resistance Army (LRA), which occupies a large area in Central Africa, poses a unique threat. LRA has been able to take advantage of political and geographic terrain that hinders both regional and international cooperation. Further, LRA represents a significant threat to humanitarian efforts due to its high mobility and capacity to carry out sudden attacks in an insecure region. Of particular concern, LRA attacks frequently include kidnapping and other patterns of forced conscription to ensure a ready supply of human shields and soldiers.

In response to this ongoing threat, GeoEye Analytics employed geospatial predictive analysis to better understand LRA's geospatial pattern of activity, with particular emphasis on the relationship between LRA attacks and IDP camps in central Africa. Using Signature Analyst® (SA), the GeoEye Analytics team created a statistical model or "signature" of LRA activity. SA was also used to identify the geospatial factors that contributed most to the signature and determine how they contributed (e.g., attracting or repelling). These models can aid decision-makers to better understand and anticipate LRA attacks, particularly as they relate to IDP activity, and thus support of information-based approaches to prevention, mitigation, and response.

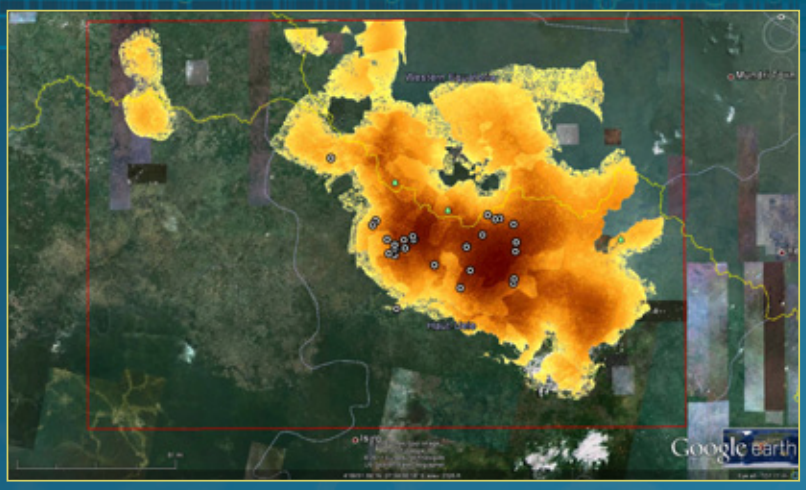

Figure 1. © 2011 Google

Figure 1 depicts the Signature Analyst assessment for future LRA activity in a given area based on previous attack data (2008–2010, inclusive). Plotted points illustrate LRA attacks reported after the original assessment was created and disseminated (09/03/11 through 11/15/2011, LRACrisisTracker.theResolve.org) and provide validation for the model.

The initial assessment revealed that LRA activity envelops IDP camp locations, indicating a strong correlation between IDP camps and LRA attacks. Additional analysis of the geospatial factor layers confirmed that IDP camp location was statistically associated with LRA attacks. As depicted in the figure, analysis of LRA attacks perpetrated after the original model was created and disseminated aligned with identified high-likelihood areas and provided validation of the original model.

The implications of this work affect at least three areas. First, the ability to proactively identify LRA attack trends and patterns enables proactive approaches to prevention, thwarting, and information-based response. Again, the most reliable predictor of LRA activity has been IDP camp location, underscoring the potential threat to this population. Given the LRA propensity to kidnap their victims, recent analyses have further segmented attacks into those involving kidnapping and those that do not in an effort to better understand LRA activity. These assessments have been similarly effective in their ability to identify attack patterns and trends.

Second, the protracted violence has created a pending sociocultural disaster in the region. Estimates suggest that the number of individuals kidnapped over the past twenty years of LRA activity has been in the tens of thousands. While it is clear that many of these kidnapped victims did not survive, given their maltreatment and use as human shields, the potential consequences for individual victims and the region are staggering. This is particularly true for the children kidnapped and forcibly conscripted during critical periods of emotional, moral, and even physiological development. Moreover, the climate of fear created by the predatory behavior of the LRA has had a significant impact on the social and cultural fabric of the community, including even routine activities and social discourse in the region. Social science research suggests that the impact of the LRA on the human terrain and culture in the region will be felt for many years into the future. The ability to effectively assess and model this will be critical to information-based approaches for humanitarian support and related community development, which can ultimately lead to improved outcomes for the African communities that have been terrorized by these groups for so long.

Finally, this work could be translated to other identified terrorist organizations operating in the region, including those that prey on or otherwise influence IDP and refugee populations. The activities of the al-Shabaab group in and around the southern half of Somalia and Somali refugee camps such as those near Dadaab, Kenya, provide an opportunity to use the same HSCB modeling tools on a comparable problem. Comparing and contrasting the geospatial patterns, tactics, techniques, and procedures, and important environmental factors characterizing these groups will deliver better insight into this general class of humanitarian crisis, further supporting information-based approaches to humanitarian and relief efforts.

Scarcity of 6.4 Funds

It is not unusual for the terms 6.2, 6.3, and 6.4 to be used in reference to the funding of HSCB Modeling Program projects. Because many readers may not be familiar with those terms, this article defines and discusses how they relate to one another, focusing on 6.4 in greatest depth; it is the rarest of the research funding types, at least in the sociocultural behavior domain.

In the Department of Defense (DoD) Research, Development, Testing and Evaluation (RDT&E) environment, different funding lines exist to meet a range of research needs, spanning basic research (6.1), applied research (6.2), advanced technology development (6.3), and advanced component development and prototypes (6.4). As programs move from 6.1 to 6.4, the time horizons for delivery of an operationally usable product shorten. While basic research provides the fundamental building blocks of knowledge in a domain, that knowledge does not generally take the form of a product that can be deployed in an operational setting. A portfolio heavily skewed toward early-stage research can make a strong contribution to fundamental domain knowledge and to satisfying long-term strategic needs, but rarely makes an immediately useful operational contribution. Conversely, a program heavily skewed toward delivering validated operational tools and methods can have an immediate impact on operational needs, but does not necessarily contribute to foundational domain knowledge. Programs whose missions span a range of funding lines must develop an appropriate balance so that they meet near-, mid-, and long-term needs. Sustaining this research balance requires that program managers maintain open lines of communication with other program managers responsible for sociocultural behavior research and engineering in the DoD context, remain aware of scientific advances in the field, and coordinate with operational users who are attuned to strategic, operational, and tactical requirements.

The HSCB Program is unusual relative to other programs in the sociocultural behavior domain in that it spans three of these four levels: Program Element (PE) 0602<u>2</u>3670D8Z supports 6.2 work, PE 0603<u>3</u>670D8Z supports 6.3, and PE 0604<u>4</u>670D8Z supports 6.4. While HSCB 6.2 focuses on developing an applied science base and general-use, cross-domain capabilities to support the HSCB application domains of analysis, operational planning, and operational experimentation, HSCB 6.3 research funds are directed toward modeling for forecasting; demonstration of strategic decision-making tools that highlight sociocultural factors; and visualization software toolsets that can be used as strategic decision-making tools to account for political, religious, cultural, and other factors. HSCB 6.4 funding matures, hardens, and validates HSCB modeling-related software for transition to meet the needs of the warfighter, integration into the architectures of existing Programs of Record, and/or maturation of software via open architectures to allow broad systems integration.

The HSCB Program has about one-third of its funding in the 6.4 Program Element; hence the program's emphasis on performing outstanding research and getting capabilities out to the field. Getting capabilities to the field requires that we validate technologies and demonstrate the improvement that they provide. In signal detection theory, we would simply use techniques such as Receiver Operating Characteristic (ROC) curves to demonstrate performance (and the increase in performance brought about by selected technologies). While we can in fact do this for some of our HSCB technologies, it is not always the best performance metric, especially for sociocultural modeling and research such as we develop in the HSCB Program. Thus, we have other techniques to demonstrate performance. The challenge to all of our 6.4 performers is determining how to demonstrate the performance of their systems and the improvement that they provide.

HSCB is fortunate to have 6.4 funding. We take our warfighter prototyping responsibility seriously, and have numerous prototypes in place or in development.

CALENDAR

Date	Event	Location	Website
April 3–5, 2012	Event: 2012 International Conference on Social Computing, Behavioral-Cultural Modeling, & Prediction	University of Maryland, College Park, MD	www.umiacs.umd.edu/conferences/sbp2012/
July 21–25, 2012	2nd International Conference on Cross-Cultural Decision Making	Hilton San Francisco Union Square, San Francisco, CA	www.ahfe2012.org/CCDM.html

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