KnowFest

A workshop to explore building a Terrorism Knowledge Network (KnowNet)

**Sponsored by Sandia National Laboratories'
Advanced Concepts Group
18-20 August 2003
Albuquerque, New Mexico**

Executive Summary

KnowFest was a day-and-a-half workshop to explore the feasibility of, and need for, creating a knowledge network (KnowNet) to deepen the nation's understanding of terrorist behaviors. The workshop was held in Albuquerque, NM, and was sponsored by Sandia National Laboratories' Advanced Concept Group. Workshop participants included those who conduct research into various aspects of terrorism phenomena, government decision-makers who make policy and tactical decisions in the fight against terrorism, and individuals versed in the technical aspects of knowledge management and collaborative environments. A list of attendees and an agenda is in the appendix.

Workshop participants were intrigued by the KnowNet concept. When queried as to their most significant 'takeaway' from the first day of the workshop, about two-thirds of the participants responded with comments about the energy and excitement that came from the trans-disciplinary interaction among the participants, and the connections they made with interesting individuals who could contribute to their work. This, in and of itself, is a strong endorsement for the KnowNet concept and the potential value of collaborative communities for addressing this pressing national security problem. However, conversations during the workshop highlighted the difficulties of communicating across different communities of knowledge, bridging vocabulary and paradigmatic gaps, and ensuring that such a network did not become a security risk.

A good portion of the workshop time was spent refining and clarifying KnowNet's parameters. The group converged on a general statement of purpose and scope for KnowNet:

> KnowNet is a distributed, collaborative, trusted terrorism /terrorist/terrorized knowledge discovery system which helps users exploit data for near-term decisions, explore data for long-term decisions, and understand the impact of the long-term on near-term decisions, and vice versa. KnowNet serves as a value-added assistant to enhance user access to many types of information, information sources, analysis tools, and experts.

Key concepts embodied in the definition are that KnowNet is a process enabler not just a data repository; it deals with all aspects of the terrorism phenomenon, from the perpetrator to the victims to the choice and execution of methods; and it can be helpful in many different types of research and decision-making venues.

Details

As a great deal of the workshop discussion focused on defining various dimensions of KnowNet, the general statement of scope that emerged from the discussion will serve to organize this report. That statement is as follows:

> KnowNet is a distributed, collaborative, trusted terrorism /terrorist /terrorized knowledge discovery system which helps users exploit data for near-term decisions, explore data for long-term decisions, and understand the impact of the long-term on near-term decisions, and vice versa. KnowNet serves as a value-added assistant to enhance user access to many types of information, information sources, analysis tools, and experts.

Distributed: In a distributed system, value accrues in small amounts throughout the system. Overall value thus is not located in a single output (e.g. an 'answer'), but rather in the enhancement of the capabilities and contributions of all members by their engagement with the system. This has several implications. First, it means that the system must offer different value propositions to different types of users (see section on 'collaborative' below). Second, it means that a decision-maker must see KnowNet as a *decision support* system, rather than an *answer-providing* system. Finally, 'distributed' has certain important technical implications for the movement and management of different types of data across different types of platforms, allowing easy access by users of varying levels of technical sophistication at multiple points in the system.

In addition to the physical implications of 'distributed,' the nature of terrorism research was recognized to require multiple perspectives, with non-Western views being of particular importance. Currently, the community of terrorist experts globally is not well connected and is located primarily in states where terrorism has been an historic problem—such as the United Kingdom, Israel, key European countries, and Southeast Asia. A key value of KnowNet could be to enable the sharing of the expertise, data, and wisdom from these researchers who are currently relatively isolated from each other. It was pointed out that these researchers had in the past attempted to bring their data together in a distributed manner, but the technical difficulties presented barriers that had not been overcome in the past. These researchers welcomed a renewed effort in this direction.

Collaborative: Participants identified several different types of participants in KnowNet. Note that an individual or organization can fill more than one participant role. 'Contributors' would provide either data or questions, that is, either source materials or organizing principles for use. 'Owners' would pay for and/or provide the technical expertise needed to build and maintain the system. 'Users' would be those who would use the system to access information sources, whether those sources are static databases, people, or real-time observation systems. Users could include the media, the intelligence community or others in government, academia, industry, non-governmental organizations (NGOs), and citizens. Most importantly, each participant type and each group within each type will need to see some clear value from participating.

Besides the individual value that must accrue to participants, the collaborative environment should be such that it facilitates the emergence of knowledge and understanding that is much greater than the mere synthesis of the knowledge of all participants. The environment should be such that it encourages ongoing dialogue and mutual exchange between members, and provides participants with access to capabilities and teaming opportunities that would be difficult otherwise. For example, through KnowNet, social science researchers in academia or think tank could team up with information and computer scientists for modeling and analysis of their data through tools created for public benefit through federally funded programs. Demonstrations of these types of collaborations were presented and discussed for their value added. In one, a participant's personal research data on Al Quaeda members was analyzed using social network and data visualization tools developed within the national laboratories to answer questions that

the participant had regarding the type of social network his data implied. In another, multiple bibliographies of terrorist literature was visually analyzed using computer tools to provide the group insight on where the bulk of research currently focuses in terrorism studies. In addition to these demonstrations, several collaborations were identified during the workshop for participants to engage in through KnowNet, such as social scientists in private practice and in academia working with academic researchers in computer science to create computerized 'bots' carrying messages suitable for reassuring the public during terrorist threat situations.

It is worth noting here the recurring discussion over the question types that would most benefit from KnowNet. Participants identified three general types of questions, each of which was the domain of a different type of community. Near-term, or more tactical questions, are the province of the government and law-enforcement officers and decision-makers and supporting analysts. Long-term, or more strategic questions, generally are the province of the academic or research community and the policy community they support. The interaction of tactical and strategic concerns (i.e., the long-term impact of tactical decisions) clearly could be of interest to both communities—but is under-studied, as there are few mechanisms to effectively connect the academic and research communities with government and law-enforcement officers and decision-makers. This might be a key niche for KnowNet.

Trusted: This dimension received a great deal of time during discussions. The discussions of trust focused on the technical system itself, the community of users/participants, and the data in the system. The discussions around the data were concerned with vetting the sources, particularly true in social science arenas where different schools of thought can lead to the production of different data sets or interpretations of data. Vetting the community of users and participants had several dimensions. There is a clear need to disseminate the data to as wide a variety of players as possible to make the KnowNet system as robust as possible, while keeping data/information from those who might use it in malevolent ways. Nested levels of classification was introduced by some as a way to handle this issue, but all noted the propensity to protect information (e.g. to classify it) often takes precedence over the perceived value gained from the collaboration through a KnowNet-like system. The undesirable aspects of restricting the system to only U.S. users also were of concern. The merits and issues of the converse problem—opening the system to general use and the attendant problems of vetting the qualifications of participants—also were discussed. Finally, the technical system itself needs to be trusted. Participants need to believe that the system is reliable.

There was a short discussion of how to create the community-based trust a KnowNet system would require. Many participants noted that, while the trans-disciplinary nature of the workshop was quite stimulating, it also made for some very difficult conversations as they moved across disciplinary languages and paradigms. Two alternative approaches were proposed. One was that a culture or community needed to be developed first through face-to-face interaction. Once that was established, technical tools (such as electronic communication of various sorts) could be used to maintain it. The alternative (almost diametrically opposed) proposed approach was that the technical tools be used to facilitate the development of a community, much in the way many Internet-based communities have emerged. While this discussion was not pursued in this workshop, it does illustrate some of the large gaps, which will need to be overcome to engage all in a KnowNet-like community.

System: The KnowNet concept was likened to the information ecology paradigm. It is a dynamic, complex, self-organizing group of individuals with very different needs who interact to add value locally and so cumulatively add value globally. The system changes over time (is dynamic) as participants move in and out of the community, and contributors provide different data sets and organizing questions. The 'product' is better knowledge quality that results from access to individuals, models, data, and the like. As such, KnowNet clearly IS NOT merely a data repository but IS a process enabler.

Issues, Concerns and Other Thoughts

There was a great deal of discussion about incentives to participate in the system, and the need to establish clear value propositions for the different communities of users. Several participants noted that the technical capabilities and components already exist to some large degree, and raised two questions. Why hasn't this community already self-organized? And might it do so in the near future? Some suggested as a response that a KnowNet-like system could easily lead to significant shifts in power among and within organizations, as the ability to access knowledge is acquired by a different set of individuals through the ease of access to people and data KnowNet would provide. Others pointed out that the diverse cultures of knowledge that keep various potential user communities distinct are very hard to overcome. The notions of security and restricted access also were raised as impediments. Many important players in the terrorism field are not US citizens: how would their participation affect the openness of KnowNet? If information is transformed into knowledge immediately useful in the war on terrorism, it often is quickly classified, precluding the preponderance of potential KnowNet users from access to it. The system thus becomes incomplete, reducing incentive to participate. Finally, it was suggested frequently that the KnowNet organizing topic, 'terrorism,' was too broad and diffuse. It could engage everyone from area experts for locations as diverse as South America, Sri Lanka, and the Middle East, who might provide contextual information, to tactical experts who would provide details on offensive operations in specific locales. Workshop participants suggested that focusing the topic would help clarify the value proposition for potential KnowNet participants.

Workshop participants proposed the addition to the KnowNet concept of two communities the organizers had heretofore not engaged. The first was the media. There was a great deal of discussion over the course of the workshop of ways in which KnowNet could help create a more responsible media by providing it quick and easy access to vetted background and explanatory information. The power of the media in a terrorist environment makes development of such responsibility extremely attractive. The second group was the general public. Since the purpose of terrorism is to terrorize, if the public can be provided with access to tools and/or knowledge that will "take the terror out of terrorism," as one participant put it, we will have gone a long way toward successful engagement of the enemy.

Action Items

Workshop participants identified the following four action items, and engaged in break-out groups to begin to define an approach for each

1. Create an electronic community to enable the continuance of the trans-disciplinary conversations begun at the workshop
   Owner: MITRE and Sandia

   MITRE agreed to host a community portal. The breakout group began to identify issues of access, participation, security and the like.

2. Enlarge the community—each workshop participant was charged to identify two additional candidates for participation
   Owner: All participants, coordinated by Sandia

   Sandia will send out an email request to all workshop participants for two additional candidates for inclusion in a KnowNet-like community. The group developing the participation protocols for action item (1) will determine the mechanism for inclusion of the additional individuals. Explore and assess existing data sources and knowledge management tools, and begin the construction of connective architectures

Owner: University of Arizona, Pacific Northwest National Lab and Sandia

This group, led by the University of Arizona, will identify existing data sources on terrorism, assess and integrate existing collaborative environments, address training requirements, and consider related issues such as system sustainability and access control.

3. Develop a long-term plan for KnowNet, including the identification of a champion, an outline for development, near-term milestones, and a budget
   Owner: DTRA/ASCO and Sandia

   This group will focus on leveraging existing investments such as that made by TIA and others. It will lay out a long-term plan for champions, funding, and development.

Contact Information:
Nancy Hayden
Advanced Concepts Group
Sandia National Laboratories
505-845-9634
nkhayde@sandia.gov

KnowFest Agenda

Monday Evening, August 18

5:00 – 6:00	Reception
6:00 – 8:00	Dinner and Opening Exercise

Tuesday, August 19

7:30 – 8:00   Continental Breakfast

8:00 – 10:00   Framing the Vision
- *KnowNet in the context of SNL/ACG's mission (Yonas)*
- *Overview of the KnowNet concept (Craft)*
- *Group Introductions (Hayden)*
- *Refining the KnowNet vision (Whole Group Discussion)*

10:00 – 10:15   Break

10:15 – 11:45   Exploring the Nature of KnowNet
- *Breakout Groups*

11:45 – 12:30   Lunch

12:30 – 1:30   Exploring the Nature of KnowNet
- *Whole Group Readout*

1:30 – 2:15   Two Examples
- *Innocentive (Bingham)*
- *CopLink (Chen)*

2:15 – 2:30   Break

2:30 – 4:00   Identifying the Benefits and Pitfalls in KnowNet
- *Breakout Groups*
- *Whole Group Readout*

4:00 – 5:00   Individual demonstrations and discussion
- *Sample portal concept*
- *Associations Demonstration*

5:00 – 5:15   Closeout
- *Recap of Day (Yonas / Hayden)*
- *Preview of Next Day's Agenda*

Wednesday Morning, August 20

7:30 – 7:45   Continental Breakfast

7:45 – 8:15   Review of Previous Day's Results (Turnley)

8:15 – 9:45   Making It Real
- *Whole Group Discussion*

9:45 – 10:00   Break

10:00 – 11:00   Next Steps and Looking Toward the Future
- *Whole Group Discussion*

11:00 – 11:30   Lunch

11:30   Depart for Airport

KNOWFEST PARTICIPANTS LIST

Name	Affiliation
Ackerman, Gary (video conf)	MIIS
Betz, Harry (local)	NM Attorney General's Office (FBI Joint Terrorism Task Force)
Bingham, Alph	InnoCentive
Cares, Jeff	Alidade
Chen, Hsinchun	University of Arizona
Cummings, John	SNL / DHS
Hamon, David	DTRA
Lefkoff, Merle	LANL/Center for Nonlinear Studies
Levine, Peter	Foundation for Human Enrichment
Maybury, Mark	MITRE
Merari, Ariel (video conf)	Tel Aviv University
Medvick, Patricia	PNNL
Post, Jerrold	George Washington University
Ramakrishnan, Raghu	University of Wisconsin
Sageman, Marc	Harvard University
Saunders-Newton, Desmond	NDU
Tadros, Maher	State Department
Treverton, Greg	Rand
Urgo, Marisa	DOE/IN1
Craft, Rick	SNL/Advanced Concepts Group
Gingrich, Patricia	SNL/Advanced Concepts Group
Harris, Joe	SNL/Program Development
Hayden, Nancy	SNL/Advanced Concepts Group
Miller, Dwight	SNL/Systems Reliability
Raybourn, Elaine	SNL/Computational Initiatives
Washington, Ken	SNL/Distributed Information Systems
Yonas, Gerry	SNL/Advanced Concepts Group
Smith, Gordon	SNL/Public Safety Technologies
Beaver, Scott	SNL/Advanced Concepts Group
Boyack, Kevin	Sandia National Laboratories
Cloer, Alicia	SNL/Advanced Concepts Group
Cook, Ellen	SNL/Advanced Concepts Group
Hernandez, Gabriella	SNL/Advanced Concepts Group
Lujan, Dolores	SNL/Video Setups
Miller, Ken	SNL/Advanced Concepts Group
Monroe, Marshall	SNL/Advanced Concepts Group
Rahal, Nabeel	SNL
Turnley, Jessica	SNL/Advanced Concepts Group/Galisteo
Ungar, Jim	SNL/ACG/University of Michigan
Whitley, John	SNL/Advanced Concepts Group