Security agencies across the world are discovering that traditional approaches to intelligence gathering are no longer valid. Here, Patti Anklam and Adrian Wolfberg describe how the US Defense Intelligence Agency rebuilt it's knowledge sharing processes using peer networks, mentoring and back-to-basics knowledge processes.

CREATING NETWORKS AT THE DEFENSE INTELLIGENCE AGENCY

Revolutionizing knowledge sharing practices following 9/11

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Increasingly, many nations' security agencies are discovering that traditional approaches to intelligence gathering and analysis are constrained by structures and cultures that evolved in the cold war era. As these agencies struggle to more rapidly collect, process and act on key bits of intelligence – a capability many describe as being able to surge to a problem – they are finding a need to organize and assess work differently. In this article we describe a series of efforts undertaken to help transform the Defense Intelligence Agency (DIA) and pay particular attention to the new and growing role of organizational network analysis (ONA) in creating a more adaptive culture. By making seemingly invisible interactions visible, change agents have an entirely different means of driving targeted and more effective change programs.

The DIA is a Department of Defense combat support agency and a critical member of the United States Intelligence Community. It has over 8,000 military and civilian employees worldwide and its primary mission is to provide worldwide military intelligence to warfighters, defense policymakers and force planners, in the Department of Defense and the Intelligence Community, in support of U.S. military planning and operations and weapon systems acquisition.

A typical DIA project usually involves some sort of collaboration, whether intra- or inter-agency, in an attempt to ensure all relevant sources of knowledge are considered in a problem-solving effort. The challenge with most of these projects is to know who has relevant knowledge and then find a means of bringing that knowledge to bear seamlessly.

The DIA was one of the many federal agencies in the United States shaken by the events of 9/11 and was determined to understand what went wrong and also to plan for strategic changes that would enable them to become an integrated, collaborative organization capable of sharing knowledge. The agency director's chief of staff employed Adrian (Zeke) Wolfberg to translate this end goal into a strategic plan. Working with analysts and leaders of the agency, a plan was created and published that encompassed the following strategic goals:
1. Be the premier provider of defense intelligence;
2. Achieve a skilled workforce;
3. Become a knowledge-based organization;
4. Seek knowledge through collaboration;
5. Provide a modern, secure, and rewarding work environment;
6. Implement superior corporate leadership.

Changing an organizational mindset while balancing day to day work, in alignment with budget and resources, is a major task. A key challenge was to develop and implement a business plan for goal three: becoming a "knowledge organization." A set of operational principles was prepared:
1) Look outside the DIA for examples in equivalent

The Defense Intelligence Agency
is a Department of Defense combat support agency and an important member of the United States Intelligence Community. DIA is headquartered at the Pentagon in Washington DC. *www.dia.mil*

organizations and select successful, proven methods that could be adapted for use in the DIA;

2) Create a small team outside of line organizations that is empowered to try out new ideas and fail forward, learning quickly;

3) Look for short-term high-impact pilot projects as test beds for new ideas; and

4) Develop a voluntary network of people from across the organization who are committed to change based on valuing and leveraging knowledge.

In October 2004, a set of programs was defined based on these principles. They began to launch in March 2005. Critical to the success of the program was the small teams outside of the line organizations. This is the "Knowledge Lab Council" a core network of 27 volunteers who would help create, plan, or find new ideas for future pilot projects and to help with the execution of pilot projects. The initial set of six initiatives is shown in Figure 1 (see Page 12).

Speeding development with network analysis

The Knowledge Lab was created as a direct result of the DIA's 2004 strategic planning process. The most difficult issue was to find a mechanism to help lead the way and provide a "course correction" for the agency. The DIA had to learn how to behave differently but how could that be done? Essentially, the DIA had to learn *how* to learn, but such a mechanism did not then exist, meaning something had to be created. More importantly, it had to be created with a design that could survive the existing cultural behaviors and practices (the "antibodies") that would mitigate revolutionary change (dubbed the "virus" approach).

The team looked outside the DIA and the intelligence community and explored organizational change strategies in industry and academia during 2004 and focused on case studies that showed positive results. Three underlying principles were formed, extrapolated from industry, and applied within the context of DIA's culture to create the Knowledge Lab.

First, was that a change mechanism could not exist within a line organization because the culture, procedures and processes of that line organization would thwart innovation. At the same time, such a mechanism had to have the sponsorship of the most senior executives in the agency. This would protect the mechanism during its early existence.

Second, the work that would occupy this mechanism would focus on helping the practice of the organization, not creating high-level system solutions. This meant the change mechanism "customer" would be the employees at the working-

⊛ KEYPOINTS

- ⊛ Following the 9/11 terrorist attacks, the Defense Intelligence Agency (DIA) sought to completely change how it does business.
- ⊛ The aim was to become an integrated, collaborative, knowledge-based organization capable of gathering and sharing intelligence rapidly.
- ⊛ The DIA created a Knowledge Laboratory, with volunteers and subject experts drawn from current employees.
- ⊛ An organizational network analysis was used to review the effectiveness and discover the weak points of the Knowledge Lab.

level of DIA, those individuals who do the real work, listening to their struggles that they have to go through to be successful, and finding value through helping them.

Third, since creating anything new meant competition for resources, both financial and personnel, it was necessary to create a governance principle for this mechanism. It could not occupy physical space, not have full-time personnel and, be minimally funded. Collectively this created almost impossible conditions to succeed.

A volunteer network had to be created to make the change mechanism work – This was the most radical idea to the culture of DIA and therefore the most difficult piece of the strategy to implement.

The creation of the volunteer network was planned for when the Knowledge Lab concept was approved in January 2005. Initially the network was conceived as the entire population of the DIA. That was its ultimate state. To get there required the creation of a network infrastructure that did not exist and could not grow from any existing organization.

The initial framework consisted of a four-step network infrastructure built around concentric circles. At the center, there would be one person (in this case, as the sole full-time member of the Knowledge Lab and day-to-day activist for the idea). For the next layer, a core group of 27 volunteers was created. This core was created through a forcing function. Each line and staff organization in the DIA was tasked to provide two to three names to populate the core group. Each nominee was interviewed twice for an hour by the full-time member. This was done to ensure optimal support for the Knowledge Lab mission and, to establish a close bond between the full-time member and the core volunteers. Once this forcing function was framed within a communication strategy and as soon as the tasking was widely disseminated, more people volunteered than anticipated. In one line organization, over 10 people volunteered for the two to three slots allocated.

For the next layer, each of the 27 volunteers were asked to identify five to ten of their peers who they felt would support them and the Knowledge Lab. The outer layer was the entire DIA population. A corporate-level communication strategy was

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Figure 1. DIA knowledge intitiatives

Program	Method/source	Immediate results expected	Long-term (change) objective
Fast learning*	From BP (British Petroleum) approach first developed by Kent Greenes	Process and project improvement	Reshape thinking of knowledge "as output" to knowledge as a "process frame"
Leadership*	Social Network Analysis/Karen Stephenson	Display hierarchical ridigity of leadership network	Build trust
Knowledge Lab	Organizational Network Analysis (ONA)*/Rob Cross	Use an ONA to build and improve the network	Broaden reach of networks
Storytelling workshops	Stephen Denning*	Assist the Knowledge Lab network's capability of spreading the word to peers	Provide simple ways of communicating to management and leadership the complex reasons for and outcomes of cultural change projects
Critical discourse	Nancy Dixon*; making assumptions explicit and ensure that "nothing is left on the table"	Review past decisions and dialogues that "went bad"	Encourage individuals to be able to advocate their positions to seniors
IT relationship with end users	Cross-functional problem-solving team	Create a new model for relationship and processes	Build trust

developed to help make the connection between the last two layers.

Although the Organizational Network Analysis (ONA) is specified in the program plan as one of the key projects, note that the analysis is not the end goal or result: it was used to identify the steps needed to create a cohesive, cross-organizational "Knowledge Laboratory" team. The first step was to identify an extended knowledge network within DIA from which the candidates for the team would be drawn. Beginning with the 27 Knowledge Lab Council members, a snowball method was used to identify an additional 113 people who were known to:

• be interested in changing DIA;
• think that more collaboration is needed;
• willing to share the risk of initiating pilot projects as forcing functions to build collaboration.

The first one-hour interview with the 27 volunteer candidates was used to validate the selection criteria used to nominate volunteers within line and staff organizations. The first hour was also used to personally connect to these individuals and to transfer the vision of the Knowledge Lab and ensure the candidate was able to conceptualize this vision in their own terms. It was found that every nominee had faithfully been forwarded from these organizations as responsive to the criteria. This was

an interesting discovery. While the creation of this core network was forced, it was populated by people just waiting for the opportunity of something like the Knowledge Lab to exist so they could join up. Candidates were then asked to bring with them a list of five to ten names to the second interview. The second interview was used to further socialize with the candidates – such opportunities would be scarce in the future. Most DIA employees work in a number of buildings throughout the Washington DC area, and all of these buildings have multiple floors where employees work. An ONA survey was sent to this combined list of 140 people; 111 responded. The network analysis provided data that helped to create a story about implementing changes.

As expected given the newness of the Knowledge Lab and its members, the ONA revealed a network that was less connected than was desired. For example, the information network was assessed (i.e., mapping effective information exchanges among all knowledge lab members) it was found that only 6.5 percent of connections existed with an ideal (based on similar sized benchmarks) being closer to 11 percent. Other metrics and different relationships (e.g., awareness, problem solving, etc.) also emphasized the relative lack of connectivity in the network and specifically where efforts could be made to improve overall cohesion and effectiveness of the knowledge lab.

Specifically, the assessment revealed five opportunity points that were shared with knowledge lab members in an interactive forum. These opportunities included:

• Improving overall network connectivity by connecting key brokers through periodic problem-solving meetings and having these brokers reach out to two peripheral members.

• Increasing awareness of colleagues' expertise in the network so that the relevant people are tapped into when new crises or threats demand different expertise.

• Develop connectivity across key directorates. Overall, what the network showed was heavy clustering by directorate – with connectivity generally being much higher within a given directorate than between. Of course, everyone has limited time so the goal of the ONA was not to increase everyone's time spent collaborating with everyone else. Rather there were targeted intersections in the network.

• Overcoming barriers of physical distance that on occasion were unintentionally fragmenting networks. Physical distance of even a few feet in a hallway can start to break networks down, let alone floors in a building or distances between buildings.

- Finally, by combining a cultural assessment with the network analysis it was possible to identify where and how culture values were beginning to diffuse through the network. This kind of view allows a change agent to target cultural change much more effectively.

Using ONA data to strengthen the network

The ONA revealed a number of vital opportunities for the knowledge team to take action on. The success of the Knowledge Lab is directly dependent on the volunteer network. Understanding the baseline of this network and helping it dynamically evolve based on the view of this network has achieved unexpected results.

At the beginning of 2005, after the 27 core volunteers were selected, monthly, day-long sessions we held with the core to engage them more in the Knowledge Lab implementation. At that time, the Knowledge Lab was still an idea with no results because no pilot project was completed. However, by the end of 2005, with most of the original projects completed, a number of the core volunteers said "we know how to use such a pilot project in our organization." The core volunteers have created new connections with the rest of the DIA moving the Lab's network closer to the wider DIA population. Importantly, these were not just exercises but had actionable implications for improving the effectiveness of the knowledge lab itself. For example, a key learning from the ONA lay with the gap between people who are central to the network and those who are on the periphery. One of the interesting opportunities that the ONA helped to exploit lay with the distribution of ties in the network. Some of the more central people had approximately 30 people coming to them for information while others had only one or two ties in the group. Clearly this represented an opportunity.

For example, what happens if the most connected people leave (a clear threat with retirements looming in many government settings)? Could the ONA help to avoid knowledge loss problems for the group should central people retire or simply move on? Alternatively, was the group really leveraging its collective expertise well or had some people become bottlenecks and others under-utilized resources? What if, the team hypothesized, the DIA used ONA metrics to identify potential mentoring pairs, to match people who were highly connected with people who were not as well connected?

As an example of action that can be taken off an ONA, the DIA used a mentoring program, informed by the network analysis, to help create value added relationships. Specifically, the DIA first focused on the betweenness metric from the ONA data.

"WHILE THE PROCESS FOR NOMINATING VOULNTEERS FOR THE CORE NETWORK WAS FORCED, THE GROUP WAS POPULATED BY PEOPLE JUST WAITING TO JOIN SOMETHING LIKE KNOWLEDGE LAB"

Simply put, "betweenness" indicates the extent to which individuals lie on paths between others, and therefore indicates how well positioned people are to move knowledge around the network.

Betweenness is something that's not easily visible on a network map; you have to look at the calculations. Figure 2 (below) shows the centrality (in-degree and out-degree) for the people most central in the network. Employees 136, 65, and 59 also have very high betweenness scores. But there are also a number of individuals whose centrality scores are not high at all who also have good scores in the betweenness calculation.

Developing knowledge lab pairs

The data from the ONA was used as a starting point to identify the "brokers" and "peripheral" people who might be candidates for matching in a mentoring relationship. Although it may sound attractive to have raw data to use to identify people in this way, the actual identification and then matching process really entailed a set of heuristics that incorporated the data with personal knowledge and reflection. Although this process began with the list of 111 names sorted by the "cuts across boundaries" calculation, it quickly became apparent by looking at the names, that the "top brokers" were all well-known people Almost none of the people at the bottom of the list were familiar. By trial and error a rule of thumb was devised that included balancing in-degree and out-degree scores with personal knowledge and contextual data (this included such

Figure 2. Table shows employees who were top knowledge brokers and seekers

Employee	People Seeking Employee (In-degree)	People Sought by Employee (Out-degree)	Cuts Across Boundaries
136	24	38	3409
59	21	38	1632
65	26	16	1091
38	7	22	793
43	7	28	788
130	17	14	778
109	10	13	734
68	13	18	728
2	18	17	677
54	10	16	561
124	7	7	544
41	8	20	538

things as people who had been given extended field assignments or who would not be available for one reason or another).

Of the 111 people, 22 potential brokers and 33 people who might benefit from a mentoring relationship were identified. Each person was contacted to further qualify their availability, interest and commitment to the process. The result was a set of 12 mentors and 13 mentees.

By October, 2005, the first pair had met. The mentee in this pair, Joan (not her real name), had been at DIA for a year and had been through new employee orientation but felt she had a less-than-adequate understanding of how DIA worked. Her mentor was able to provide her with some context about the organizational structure of DIA and, most important, a sense of how everyone's job has an impact on the DIA's mission and organizational workings. This knowledge of the impacts and inner workings is what has enabled Joan to explore how she can better understand her own role and impact.

Integrating initiatives to achieve network goals

The DIA's program strategy of working with multiple small pilots as test beds while building an informal knowledge network also exhibits some of the underlying principles we see across organizations that are working at becoming networked and collaborative:

1. Use a sense-making assessment method that provides insight into the context of the organization;
2. Create a shared sense of awareness of current cultural attributes and provide employees with activities that will teach them new ways of working
3. Establish work processes and practices that will promote cross-boundary interactions and build trust;
4. Leverage information and communications technologies to enable employees to research context and reach people when they seek collaborative partners;
5. Change, clarify, and codify organizational roles and responsibilities needed to institutionalize learning and the adoption of new practices, technology, and job development skills.

For the Knowledge Lab at the DIA, the critical sense-making event was the organizational network analysis. A diagnostic like an ONA represents a probe into a complex social system, shedding a light on patterns that can and perhaps should be disrupted. In this case, and for many companies, the data produced by an ONA establishes a benchmark against which steps toward becoming a more collaborative, networked organization can be measured. The Knowledge Lab

itself is one of the pilots – and the matching of brokers and peripherals is a key intervention in the development of that network.

The Critical Discourse pilot indicates a commitment to providing the skills necessary to succeed in a collaborate environment. A cultural assessment by the consultant Nancy Dixon revealed that a barrier to collaborative knowledge transfer at DIA was the reluctance of analysts to advocate their positions. For example, when presenting an analysis to a higher-up in the organization, people often backed down when their positions were challenged rather than defending and advocating their analyses. The Critical Discourse pilot has shown, in its first two months, that the participants of the three-day workshop come away with an awareness of the nature of their interactions with others and a readiness to advocate their positions more confidently.

Looking outside of the DIA, several successful methods were studied. For example, The Fast Learning cycle, initially developed by Kent Greenes at BP and now the foundation of knowledge practices at SAIC. It focuses on three types of learning that are integrated into work process and project cycles: Peer Assists bring expertise and experience from past projects to employees who are beginning new projects, to ensure that relevant lessons from early work can be applied. After Action Reviews (as developed by the US Army) establish a regular cycle of learning throughout a project to keep team members focused on daily improvement. Retrospectives provide time for reflection after a project on what went well, what didn't, and what could be better. Collectively, these practices, "learning before, during, and after" perform a number of quality improvement functions. They can also have the intentional side effect of improving both collaborative interaction skills of individuals and also helping to connect the network as people from different functions and projects participate in the learning activities. It was decided to pilot these methods on a single project, that of the development of a collaborative learning space.

At the end of the pilot, the results were demonstrated to over 100 people in DIA over a four-week period. The results were shown to a wide variety of people at DIA: analysts, collectors, human resources, contract managers, financial and budgeting, technologists, internal and external communications, logistics, etc. The audiences also ranged in seniority and position. The overwhelming and consistent response was that everyone could envision their unique work-related issues being addressed by the "learning before, during and after" techniques of the Fast Learning methodology. The overwhelmingly common suggestion for how this

methodology could be used to the greatest benefit at DIA was in helping the newly created process which relocates people on a temporary basis from DIA's headquarters to field sites overseas and back, what DIA calls its "deployment process." Subsequently, the senior executive responsible for the deployment process was contacted and the DIA is now working with them to use the Fast Learning methodologies.

A fifth pilot has been the development of a model for enhanced communication between users and developers of information technology. The impetus for this project came from recognition of the systemic counter-complaints of users and developers: "The user complains that the technologist did not deliver what was asked for while the technologist complains that the user did not articulate their requirements." In this pilot, Knowledge Lab-sponsored working group is working with a cross-functional team consisting of four IT developers and four analysts. The goal is to define a new model for the working relationship and required communications (dialogue as well as written and codified) needed at each stage of the system's development, including requirements gathering, prototyping, testing, and so on. This pilot points the way to the development of work practices and processes that integrate knowledge across boundaries – ensuring that needs and perspectives from multiple parties are brought to bear.

At the time of writing, all the pilots are proceeding and two new pilots have started that build on learnings from the first set:

- A "Full Spectrum Analysis" project pilots a design for an on-boarding program that introduces new employees to DIA. It includes learnings from the mentoring program, Critical Discourse, and adds elements that help people understand the post-Cold War context in which the DIA operates
- The "Fresh Look" project builds on both the Fast Learning and the Critical Discourse programs to work with senior leadership to create teams that are more innovative and that can work together more productively.

Interventions in a complex world

Building a flexible, adaptive, "sense and respond" organization requires a workforce that is able to reach out and across at the time and moment of need and to build responsiveness and resilience requires a networked organization. Creating a knowledge network works best when the program consists of a number of focused methods that include sense-making followed by initiatives that will have the greatest immediate impact and opportunity for long-term system change.

Cross and Parker have often articulated the three categories of response that typically follow using

Figure 3. Managing complex learning in a knowledge network
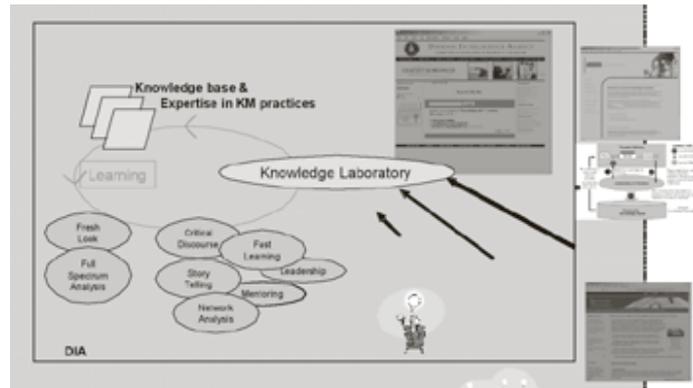
ONA as the sense-making intervention: organizational, knowledge network-building, and personal. The DIA story indicates that these categories are useful not just in developing responses to the ONA, but in developing and managing a program that grows a knowledge-based organization:

1. Understand the context and create a shared understanding of the context (organization);
2. Create the conditions that enable people to find and work with one another based on relevant knowledge (knowledge network);
3. Provide individuals with new skills necessary to engage in effective collaboration (people).

Even as the DIA itself must be a complex, adaptive system, constantly trying and learning from new approaches in response to national security threats and opportunities, The Knowledge Lab models this behavior. As a new approach is encountered, it's analyzed for a fit with the mission and strategy of the DIA's goal three. To be a knowledge-based organization means that the ways that knowledge is acquired, processed, and deployed must be continually appraised, tried, and adapted based on the results. Organizational network analysis is but one method in the toolkit developed for creating and managing programs at the DIA. KM

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