# Understanding and Leading Porous Network Organizations

## An Analysis Based on the 7-S Model

Paul T. Bartone and Linton Wells II

**Center for Technology and National Security Policy**

**National Defense University**

**September 2009**

| | Form Approved |
|---|---|
| # Report Documentation Page | OMB No. 0704-0188 |

Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

| 1. REPORT DATE **SEP 2009** | 2. REPORT TYPE | 3. DATES COVERED **00-00-2009 to 00-00-2009** |
|---|---|---|

| 4. TITLE AND SUBTITLE | 5a. CONTRACT NUMBER |
|---|---|
| **Understanding and Leading Porous Network Organizations. An Analysis Based on the 7-S Model** | 5b. GRANT NUMBER |
| | 5c. PROGRAM ELEMENT NUMBER |
| 6. AUTHOR(S) | 5d. PROJECT NUMBER |
| | 5e. TASK NUMBER |
| | 5f. WORK UNIT NUMBER |

| 7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) **National Defense University,Center for Technology and National Security Policy,300 5th Avenue SW,Washington,DC,20319-5066** | 8. PERFORMING ORGANIZATION REPORT NUMBER |
|---|---|

| 9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) | 10. SPONSOR/MONITOR'S ACRONYM(S) |
|---|---|
| | 11. SPONSOR/MONITOR'S REPORT NUMBER(S) |

12. DISTRIBUTION/AVAILABILITY STATEMENT
**Approved for public release; distribution unlimited**

13. SUPPLEMENTARY NOTES

14. ABSTRACT

15. SUBJECT TERMS

| 16. SECURITY CLASSIFICATION OF: | | | 17. LIMITATION OF ABSTRACT | 18. NUMBER OF PAGES | 19a. NAME OF RESPONSIBLE PERSON |
|---|---|---|---|---|---|
| a. REPORT **unclassified** | b. ABSTRACT **unclassified** | c. THIS PAGE **unclassified** | **Same as Report (SAR)** | **18** | |

**Paul T. Bartone** is a Senior Research Fellow in the CTNSP Life Sciences Directorate. He has conducted numerous field studies of stress, health and adaptation among military personnel and their families, covering deployments ranging from the Gulf War to Bosnia. He is a past-President of the Society for Military Psychology, Division 19 of the American Psychological Association. He is a charter member of the Association for Psychological Science, and a Fellow of the American Psychological Association. He earned a B.A. in Psychology, magna cum laude, from the University of Massachusetts and a Master's and Ph.D. in Psychology and Human Development from the University of Chicago.

**Linton Wells II** is a Distinguished Research Professor at the Center for Technology and National Security Policy, and serves as the Force Transformation Chair at the National Defense University. Prior to coming to NDU he served as the Principal Deputy Assistant Secretary of Defense (Networks and Information Integration), the Acting DOD Chief Information Officer, and the Principal Deputy Assistant Secretary of Defense (Command, Control, Communications and Intelligence). Dr. Wells holds a B.S. in physics and oceanography from the U.S. Naval Academy, and an M.S. in mathematical sciences and a Ph.D. in international relations from The Johns Hopkins University. He is also a graduate of the Japanese National Institute for Defense Studies in Tokyo.

# Contents

# Introduction and Background

Increasingly, organizations are formed by individuals and groups that share common interests and goals but are not tied to each other by traditional authorities or financial relationships. Membership in these new organizations tends to shift over time as the environment changes, participants enter and leave, and roles, activities, and interests of members evolve. This evolving organizational structure can be described as an open or porous network, one in which the boundaries are highly permeable across functional interest areas within the organization, as well as between the organization and the external environment.[1]

In late 2007, the Center for Technology and National Security Policy (CTNSP) at National Defense University launched an international research project called Transportable Infrastructures for Development and Emergency Support (TIDES) as part of a broader research effort called Sustainable Technologies, Accelerated Research (STAR).[2] STAR-TIDES projects, conducted mostly by volunteers from around the world,[3] together with a small core team at CTNSP, seek to develop and share knowledge and technologies to enhance the capacity of disparate groups to respond effectively to disasters and humanitarian crises. With participants from government, academia, industry, and non-profit organizations, the STAR-TIDES organization fits the pattern of an open, porous network. From late 2007 through mid-2009, STAR-TIDES sponsored 14 field demonstrations, displays, and field observations of novel, low-cost approaches for providing emergency shelter and life support to stressed populations. It also has supported decisionmakers and field operators in real-world contingencies, such as rural brushfires and tropical cyclones.

This paper analyzes STAR-TIDES as a porous network organization, applying a powerful organizational analysis tool known as the "7-S framework" to clarify some of the key issues that must be addressed for such organizations to be effective and adaptive.[4] The seven basic elements that are important for organizational effectiveness are strategy, structure, systems, staffing, skills, style, and shared values. Their application in this analysis leads to several recommendations for addressing leadership challenges and improving performance in porous network organizations.

STAR-TIDES is a non-traditional, largely virtual organization that includes participants from multiple countries, U.S. government agencies, non-government organizations (NGOs), the private sector, and academia. A primary goal is to foster better cooperation and coordinated action among groups that may be involved in responding to disasters and other crisis situations, and to improve the capacity of those groups to respond to and manage consequences. Key focus

---

[1] L. Hirschhorn and T. Gilmore, "The new boundaries of the 'boundaryless' company." *Harvard Business Review*, May-June 1992.

[2] In practice, "TIDES" is used to refer to specific research and demonstration projects that can leverage the worldwide STAR-TIDES network and related organizations. For consistency this paper will use the term "STAR-TIDES."

[3] Organizations outside of CTNSP on occasion have provided resources and paid employees to support many STAR-TIDES efforts.

[4] The 7-S Model is sometimes called the McKinsey 7-S Framework, because it was developed by Robert Waterman and Tom Peters while working for the consulting firm McKinsey and Company. For more on the 7-S model see: Robert H. Waterman, Thomas J. Peters, and J.R. Phillips, "Structure is not Organization." *Business Horizons*, 1980; J. Bradach, "Organizational Alignment: The 7-S Model, Harvard Business School case No. 497-045; Thomas Peters and Robert Waterman, *In Search of Excellence: Lessons from America's Best-Run Companies* (New York: Harper and Row, 1984).

areas in STAR-TIDES include trust-building and social network development, information sharing, and cost-effective logistics. Ultimately, STAR-TIDES participants aim to create effective processes that support decisionmakers and those working in the field with "knowledge on demand" across a range of operational situations.

In its first year, STAR-TIDES conducted proof-of-concept demonstrations around the United States, Central America, and Europe showing examples of technological solutions in seven infrastructure areas.[5] STAR-TIDES also has applied its social network of expertise to improve responses in real-world scenarios, including wild fires in southern California, floods in Bangladesh, and Afghanistan. Drawing on real-world experience, the expertise of its members, and knowledge about new and emerging technologies, STAR-TIDES develops scenario-based analytical templates that can be used to help identify needs and suggest appropriate equipment solution sets to assist agencies and organizations involved in disaster and emergency response and consequence management.

# Applying the 7-S model to the STAR-TIDES organization

Large, distributed, networked organizations such as STAR-TIDES that focus on particular interests and problem areas are becoming more common in an increasingly connected world. These organizations don't fit traditional structures and systems, and cannot be understood in traditional terms. By analyzing the STAR-TIDES organization according to the 7-S model, we are better able to discern the critical areas that need to be considered in the formation and maintenance of such organizations, and to promote highly effective functioning.

The 7-S model posits that organizations must be approached holistically in order to be understood; organizational elements (the 7-Ss) must be in alignment with each other for the organization to succeed, and organizations must fit or align with the external environment. The seven basic elements that are important for organizational effectiveness are: *strategy, structure, systems, staffing, skills, style,* and *shared values.* These elements are discussed below as they apply to the STAR-TIDES organization.

## Strategy

Strategy refers to what the organization does that provides unique value or competitive advantage. For example, some organizations seek to offer low-cost, no frills solutions; others emphasize service and convenience. Strategy addresses the question, "what is your niche?"

What is the STAR-TIDES strategy? Or, in the terms of the 7-S framework, what is the unique contribution of TIDES? According to its vision statement, STAR-TIDES seeks to "contribute effectively to building security and saving lives in stressed environments worldwide through building trust in social networks, open information sharing, and cost-effective logistics." While there are many organizations that seek to improve capacity to respond effectively to disasters and the range of humanitarian crises, STAR-TIDES has several unique characteristics.

Most importantly, STAR-TIDES is unusual in its ability to bridge gaps between public and private entities, facilitate whole-of-government solutions, and engage international participants within an integrated research and planning framework. The STAR-TIDES leadership also can

---

[5] The seven STAR-TIDES infrastructures are: shelter, water, power, integrated combustion and solar cooking, heating/lighting/cooling, sanitation, and information and communications technology (ICT).

provide inputs concerning U.S. government (USG) and DOD policies in many of these areas due to strong professional relationships. The STAR-TIDES organization seeks to leverage its extended social network to identify, evaluate, and communicate new, low-cost, readily available solutions to the basic infrastructure needs of stressed populations.

Second, STAR-TIDES focuses on a wide range of contingencies: domestic and foreign, short-term and long-term, with or without military involvement. Its scope extends beyond the limits of any single government agency and most private organizations. Because of its broad focus, STAR-TIDES works actively across agency and organizational boundaries.

Finally, STAR-TIDES addresses problems across six broad functional areas:
- Capabilities. Gathering, sharing and evaluating information about low-cost infrastructures and related activities.
- Social Networks. Building open and active coalitions among experts—from any organization or part of the world—who have background and knowledge in key areas, and among the business, government, and civil society stakeholders who will have to live with and sustain the solutions on the ground.
- Policy, doctrine and operational procedures. Converting high-level guidance into effective field procedures.
- Legal and regulatory issues. Complying with all laws and regulations, while identifying and working to change those that impede cooperation and unity of effort.
- Resources. Identifying needs for both the short and long terms.
- Training, exercises, and education. Maintaining readiness, capturing lessons learned, and preparing future leaders.

Through all of these activities, the unique strategy niche of STAR-TIDES lies in its holistic approach, addressing a broad range of scenarios while considering both technologies and human-social factors; and its openness, with all agencies, groups, and individuals welcome to contribute, and with nothing secret or proprietary.

## Structure

Structure is about how the organization is arranged or configured. Many organizations take a *functional* structure, in which different branches of the organization specialize in particular functions, such as manufacturing, sales, and service. Another common form is a *divisional* structure, in which divisions are arrayed according to geographical regions, products, or some other factor, and each division contains a full complement of functional elements (e.g., sales, service, R&D).

In 7-S terms, STAR-TIDES has evolved from a functional structure when it was first established to its current open or porous network structure. Figure 1 shows the initial functional team approach. At that early stage the project was called "Expedient Infrastructures for Transient Populations," or EITP, and focused mostly on low-cost, tangible infrastructure components that could be delivered quickly to distressed areas. As originally conceived, separate cells or divisions would be formed to serve each of the key functional activities of the organization. This functional structure was never implemented, largely because of limitations of funds and people. However, the major functional elements illustrated in figure 1 still provide a useful picture of the principal activities and goals of the organization.

Figure 1. Original Functional STAR-TIDES Structure: Expedient Infrastructures for Transient Populations (EITP) Model
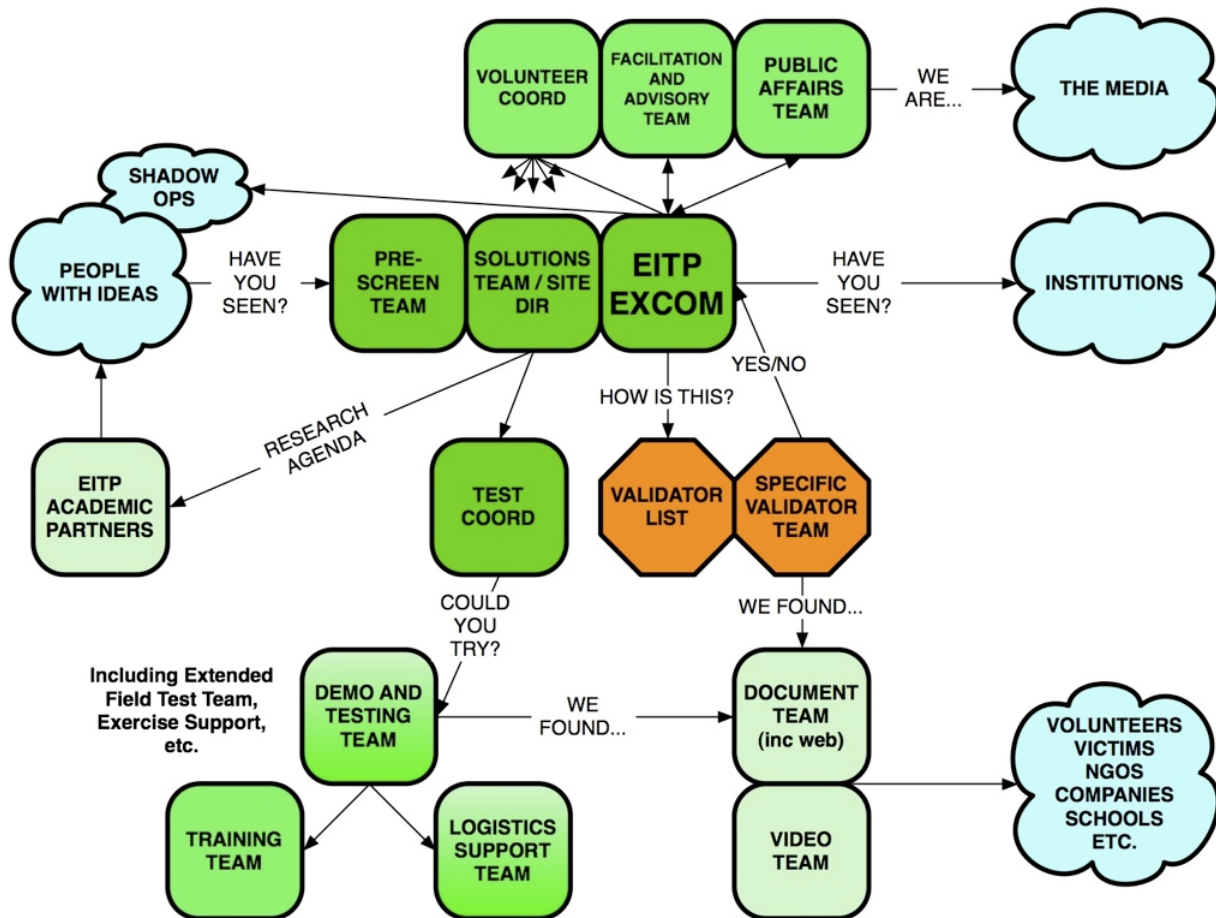


The box at the center of figure 1 represents EITP's Executive Committee (EXCOM), whose membership was envisioned in 2007 as consisting of 7–10 people, each with a crosscutting understanding of the project. The EXCOM was intended to be the core decisionmaking body for the organization. Boxes at the top of the chart (volunteer coordinator, facilitation and advisory team, and public affairs team) focus on outreach functions, including media relations and interactions with volunteers and expert advisors and facilitators.

In this model, people with ideas/innovation "at the edge," as well as ideas from academia, would be linked to the organization through a pre-screen team, which would screen ideas and present the best ones to the solutions team. The solutions team was to look at integrated, whole-systems approaches, and also provide site directors to oversee demonstrations and testing activities. The solutions team also was intended to work with academic partners in developing and refining a research agenda.

The "Shadow Ops" cloud in the upper left of figure 1 refers to the kinds of operations conducted by Dr. David Warner for several years through his Synergy Strike Force organization. These are investigations and experiments conducted in parallel with scheduled events, but not on the critical path for the main activity. For example, for the 2003 Super Bowl in San Diego, Dr.

Warner's group established an ancillary or "shadow" electronic communications and sensor network that was independent of the primary communications network used to coordinate Super Bowl activities.[6] Some of the shadow sensing and information sharing results proved useful to the activity coordinators. The shadow ops, in turn, benefited from engagement with the core processes. The net result was benefits to all concerned. Shadow ops have proved to be an effective way to leverage expensive, scheduled activities, adding value by providing useful information as to what worked and what did not.

For each EITP test event, the concept was that a test coordinator would be tasked by the solutions team and the site director to evaluate new ideas and systems. This work would be carried out by the demonstration and testing team, which also would identify any training and logistics requirements needed to conduct the evaluation and pass the information to the training and logistics support teams. Additional functional groups or teams would be established to keep records and make them publicly available. In addition to a general document team, a specialized video team would make video and audio recordings of test events. As more experience was accumulated with particular products or systems, the expectation was that some products would be submitted for evaluation or validation by external test groups, with results posted to a validation list that would be publicly available for anyone to draw from. The cloud-like boxes in figure 2 represent important outside groups that the organization interfaces with, including the media, a range of public and private institutions that are both customers and idea generators, and educational and community groups that can participate and assist in a variety of ways.

The testing and validation functions at the bottom of figure 1 raised an important issue as STAR-TIDES matured. The original EITP concept included formal testing and analysis, producing documented lists of products whose performance characteristics had been documented and validated. However, it became evident that this would require a set of test and evaluation skills that probably could not be built into the largely voluntary STAR-TIDES model. In addition, details of a formal set of testing results might reveal proprietary information, generate legal issues, or produce conclusions that would not be sharable on the open STAR-TIDES website.[7] As a result, STAR-TIDES field activities are considered to be "observations," or "operational experiments," rather than formal "tests" that generate different expectations about outcomes.

In practice, rather than the functional structure proposed in the EITP model, the structure of STAR-TIDES developed as a porous network composed of mostly volunteers from many organizations around the world, drawn together by common interests. The term *porous network* connotes that members can enter and leave the organization easily, and that it is a broad association of interconnected participants. The shape of the network to some degree reflects shared interests in particular infrastructure domains (see figure 2), but also is influenced by other factors, including associated agencies and projects (see figure 3), and events such as earthquakes, floods, fires, and other disasters that stir interest and mobilize activities.

In the current porous network structure, functional activities are dispersed across multiple members and organizations participating in the STAR-TIDES organization. However due to the amorphous and dynamic characteristics of the network, members often shift between areas and

---

[6] Notes and documents on the "Shadow Bowl" exercise conducted at the 2003 Super Bowl in San Diego, California are available at http://shadowbowl.sdsu.edu/.
[7] See www.star-tides.net.

drift in and out of the network altogether. Figure 2 depicts these aspects of the STAR-TIDES network, showing the organization as a series of overlapping "clouds" of interest groups corresponding to the seven infrastructures on which it focuses. In practice, the different functional areas actually intersect and overlap more than the figure suggests, because the focus of the project has grown to include such areas as social network development, operational procedures, and legal and regulatory constraints. These action areas contribute to STAR-TIDES' uniqueness as an organization that allows planners to engage public-private, whole-of-government, and transnational stakeholders.

In addition to its worldwide network of volunteers, STAR-TIDES has a small core team at National Defense University's Center for Technology and National Security Policy (CTNSP). This team is responsible for initiating and coordinating the key functions described above.

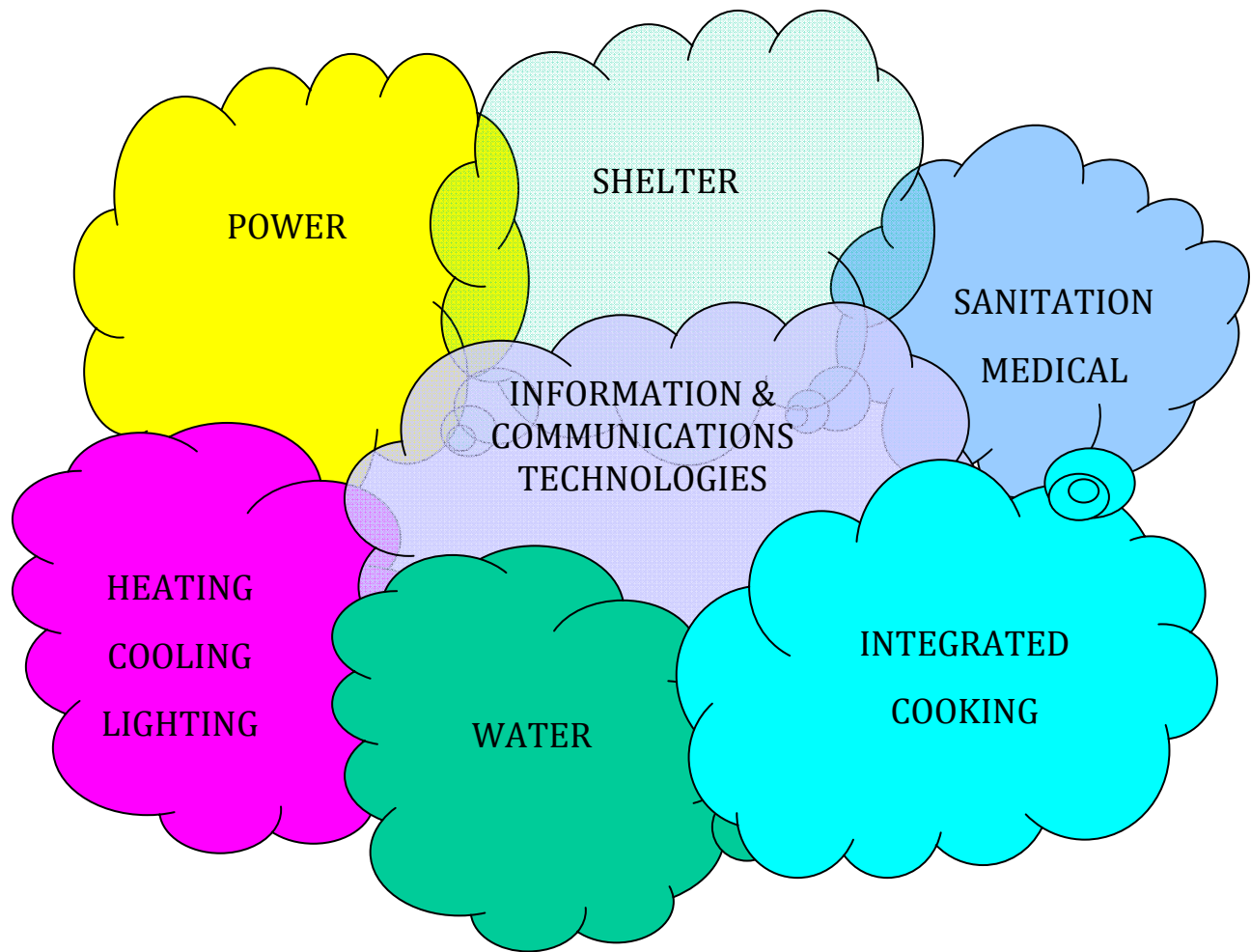Figure 2. STAR-TIDES Overlapping Functional Interest Groups in the Network

Figure 3 provides a more detailed picture of some of the key agencies and groups involved with the STAR-TIDES project as of early 2009. Beyond the small core team at CTNSP, members of the network come from a broad range of U.S. government agencies, NGOs, and academia. Represented in a single box are the many private sector individuals and firms who participate in the STAR-TIDES network in various ways, including the STAR-TIDES demonstration projects. The future structure of STAR-TIDES has also been envisioned as a "starfish network," utilizing distributed talent with minimal central orchestration.[8]

Figure 3. STAR-TIDES Major Participating Groups
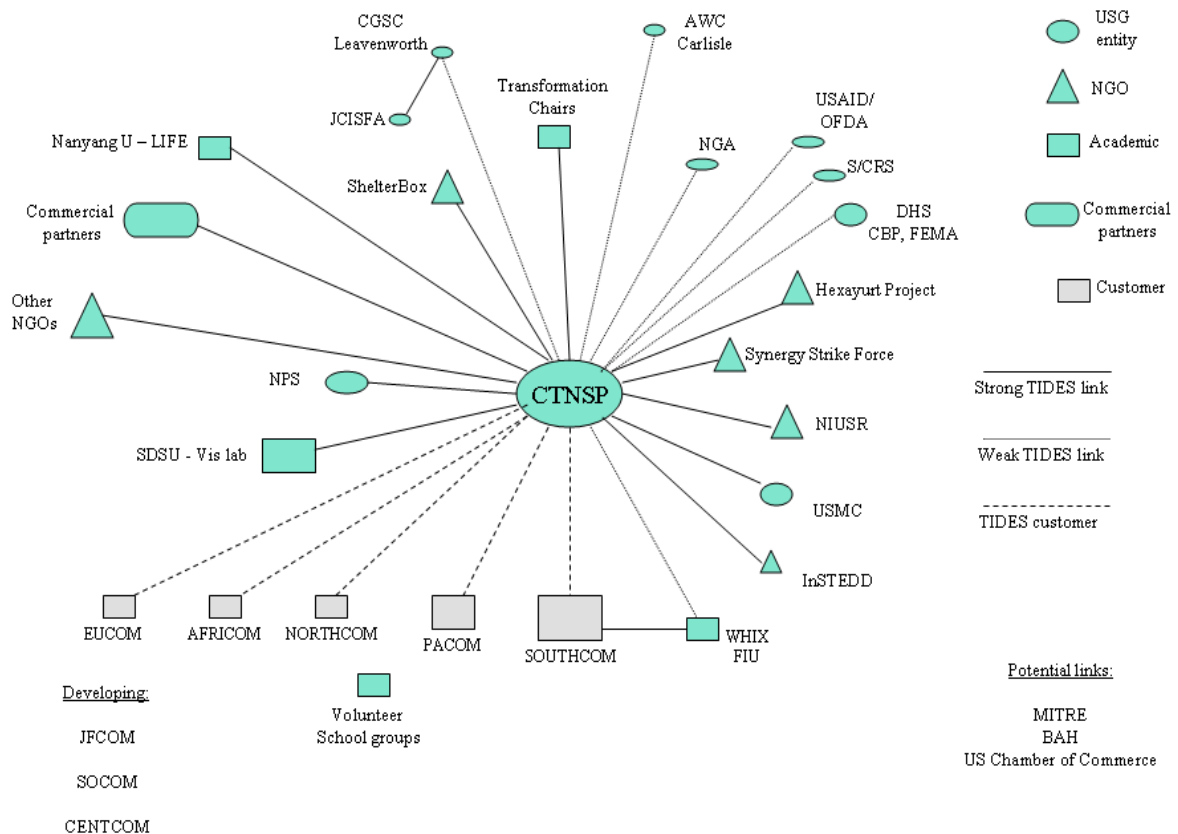


## Systems

Systems refers to the rules and regulations, standards, and processes for getting things done and managing the activity of the organization, both formal and informal. They include personnel evaluation and practices, pay and rewards, performance assessments, supervisory and chain-of-command relationships, and policies for planning, monitoring, and executing projects.

---

[8] See Linton Wells II, Walker Hardy, Vinay Gupta, and Daniel Noon, *STAR-TIDES and Starfish Networks: Supporting Stressed Populations with Distributed Talent,* forthcoming Defense & Technology Paper from the Center for Technology and National Security Policy.

In the first year of its existence as an organization, the principal process was a series of STAR-TIDES demonstrations and displays intended to educate and communicate to a broad audience what STAR-TIDES is about. Displays are static events, such as trade shows and conferences. Demonstrations are working events, including examples from as many infrastructures as possible. These have been complemented by field observations to begin gathering experience with infrastructures in operational environments. The STAR-TIDES demonstration includes working, hands-on examples of representative, low-cost items from each of the seven infrastructures, along with descriptive information boards and brochures. Between September 2007 and mid-2009, fourteen STAR-TIDES demonstrations and displays were held around the world.

In most demonstrations, infrastructure equipment is shown in actual operation, and experts are available to explain and answer questions. The events typically include three or four shelter types; an integrated cooking station with several solar cooking devices, high-efficiency stoves, and heat-retaining baskets; various heating, cooling, and lighting solutions; small-scale power generating systems; several water purification and pasteurization methods; and a range of portable ICT systems for local and global communication. When possible, demonstrations set up independent, off-grid electronic communication systems, as well as power generation using solar or small gasoline engine generators.[9] The STAR-TIDES demonstrations and displays have been the primary system for communicating what the organization is doing, while also providing proof of concept for the various technologies and procedures on display. Future plans call for conducting more scenario-based analyses and field observations.

Other key systems in the organization are those applied to the preservation, storage, and public sharing of information, and systems used for communicating across the STAR-TIDES network. The STAR-TIDES website provides tools for posting and preserving relevant information and conducting online discussions. E-mail is an important network communication tool, with extended email exchanges occurring regularly on such topics as water purification, emergency shelters in various environments, and the sharing of satellite imagery across agencies to improve relief response in earthquakes, hurricanes, floods, and other disasters. When a relevant problem emerges in the real world, a STAR-TIDES member can "pulse the network," asking for information (usually by email) on the topic, thus tapping into expertise that is distributed across the network-organization.

An example of how these systems operate is provided by the southern California wild fires that occurred in late 2007. Shortly after the fires broke out, the STAR-TIDES coordinator sent an email message out to the entire network asking for ideas or information that could help those responding to the crisis. This query led to the discovery of high-resolution, aerial imagery capabilities at NASA. STAR-TIDES subsequently worked through U.S. NORTHCOM (Northern Command) to help ensure that NASA imagery capabilities were available to support local fire and emergency response organizations, which helped them target their efforts more effectively.

In addition to the systems mentioned above, communication within the STAR-TIDES network also relies on more traditional tools, including periodic, face-to-face meetings of the core staff,

---

[9] For example, the October 2008 demonstration at NDU started from a "cold, dark, quiet field" with no access to power, water, or energy. Within a day and a half, seven satellite networks were up and operating off the power grid, a third of the site was being powered by solar power with wind backup, water was being purified directly out of the Potomac by portable units, and meals were being cooked in solar ovens.

individual phone calls and conference calls, focused briefings, and the distribution of printed brochures and STAR-TIDES information papers. Web 2.0 tools such as Twitter, FriendFeed, and blogs increasingly are being included, but are still underutilized.[10]

As STAR-TIDES moves from the proof-of-concept stage to research and evaluation, the fall demonstrations at NDU will be retained, but emphasis will shift to producing and refining analytical templates and gathering data about related systems that will guide the evaluation of different infrastructure solutions across a range of scenarios. Also important in the next phase will be systems and procedures for recording, analyzing, and reporting performance data on cost-effective infrastructures.

STAR-TIDES also has developed specific processes to address needed policy changes within DOD and other Federal departments and agencies. For example, DOD recently issued an instruction on leveraging information in stressed environments that states, "It is DoD policy … that: [11]

> a. … information-sharing activities that facilitate coordination and cooperation between DoD and non-DoD partners will be established to enable common understanding of the stabilization and reconstruction, disaster relief, and humanitarian and civic assistance environment; and to support an integrated Whole-of-Government response capability.

> b. In response to … validated requirements, the Department of Defense or Military Department Headquarters may resource ICT capabilities to share spectrum or bandwidth, and to provide associated ICT infrastructure services …."

There are, of course, caveats related to "to the extent authorized by law, and subject to applicable statutory and regulatory restrictions and limitations," that have to be addressed as proposals are translated into field operating procedures; but this is still a significant advance in DOD information sharing policy.

STAR-TIDES facilitated this policy change by showing, in several demonstrations, real-world activities and related projects, that much can be done without compromising secure military communications networks.  This experience reflects the importance of discussions among public-private, whole-of-government, and transnational stakeholders. In future operations in which military and NGO elements work together, the new policy will facilitate improved cooperation and communication with NGOs and other civil authorities. One goal is to increase unity of effort across the diverse groups involved in the planning and response phases, even when unity of command is not possible. This is an important concept for mission success in complex operations.[12]

In porous network organizations like STAR-TIDES, achieving internal unity of effort is complicated by a number of factors. Because membership is largely voluntary and constantly changing, it may be harder to gain acceptance and compliance with systems and policies such as

---

[10] See, for example, Mark Drapeau and Linton Wells II, Defense & Technology Paper 62 *Social Software and National Security* (Washington, DC: Center for Technology and National Security Policy, April 2009).

[11] DODI 8220.02, Information and Communications Technology (ICT) Capabilities for Support of Stabilization and Reconstruction, Disaster Relief, and Humanitarian and Civic Assistance Operations, April 30, 2009, available at http://www.dtic.mil/whs/directives/corres/pdf/822002p.pdf.

[12] For example, see Hans Binnendijk and Patrick Cronin, editors, *Civilian Surge*. (Washington, DC: National Defense University Press, 2009) and remarks by LTG Christianson at the March 2008 National Defense Logistics Association annual convention, Miami, Florida.

how to communicate across the network (e.g., global emails, blog postings). For those working in the core STAR-TIDES group, standard operating and accountability procedures are needed (e.g., checklists) to assure consistent accomplishment of primary activities. These procedures include planning and executing demonstration projects, managing equipment and supplies, and documenting lessons learned. Beyond the core staff, guidelines for communication and participation within the extended STAR-TIDES network need to be further developed and promulgated.

Adding to this challenge is the fact that STAR-TIDES members also belong to other organizations that have their own systems and procedures guiding behavior and activities that may not be aligned with those of STAR-TIDES or other organizations within the STAR-TIDES network. For example, DOD and the State Department have their own, independent IT/communications systems and access rules, which can impede the sharing of electronic files and messages across platforms and organizations. The same problem exists in various forms with NGOs. In addition to compatibility issues, those working in the private sector are sometimes unwilling to share information and technical data because of proprietary concerns and business interests. There are also potential conflicts among various STAR-TIDES network members in the realm of shared values, discussed below.

## Staffing

Staffing refers to people in the organization and how they are recruited, selected, and trained to perform their jobs. Leadership is included in this category, whether leaders are selected from the outside or developed from within. Staffing addresses the question of how the organization assures it has the right people to do the work. This is an especially challenging issue for a largely volunteer, open organization like STAR-TIDES. Like many volunteer organizations, a core team is paid to work on the STAR-TIDES project, at least part-time. An important consideration is whether this core team is sufficient to meet the essential tasks of the organization, including:

- *Managerial*. Setting strategic priorities, hiring, and priority-setting,
- *Operational*. Planning and executing STAR-TIDES demonstrations, purchasing, maintaining, storing, and tracking equipment, etc.,
- *Advanced clerical*. Building and maintaining web presence, updating content, storing files electronically and in hard copy, correspondence, tracking actions, etc.,
- *Financial*. Managing the funds of the organization, maintaining records, and paying bills, and
- *Legal*. Assuring that all activities and actions are appropriate and lawful.

The more difficult aspect of staffing for an organization like STAR-TIDES is how to effectively access the diverse, global network of volunteer participants with expertise in relevant areas. There is no real opportunity to select or screen these people, and the nature of the porous network is that people enter and leave the organization at will. A challenge for the organization and its leaders is to attract and retain experts. Another leadership challenge is to support and foster open, creative exchanges, while reducing opportunities for misunderstandings among members. It may be possible to develop some specialized systems that could be applied in porous network organizations (e.g., email standards and courtesies) to reduce misunderstandings and related problems. How does the organization manage extreme positions or views within the network? How does it host exchanges and activities that involve private partners with commercial interests and potential conflicts of interest? A related issue is the need to balance

privacy concerns with the general goal of keeping all information and dialogue open and public. Security is also a concern as regards the potential involvement of individuals or groups who may wish to do harm to the network. Here, too, specialized systems and procedures may be needed to manage these risks in a way that maximizes the participation of volunteer experts, while minimizing or excluding those with nefarious intent.

## Skills

Skills are the special, distinctive competencies of the organization, both in the people and the organization itself. What is the organization good at, and what special skills and competencies are found its people? What are the special skills of STAR-TIDES, not so much in individuals, but as an organization? The skills domain relates closely to the strategy of the organization, that is, what is the special niche of the organization, and what are we good at doing? STAR-TIDES and the people in it are especially skilled at:

- building social networks, making contacts, and developing relationships that span organizational boundaries,
- identifying new and emerging infrastructure solutions by keeping in touch with the "commercial edge" in new infrastructure technologies, and especially by focusing on whole-systems, crosscutting approaches that link different approaches together,
- developing new avenues and systems for sharing data and imagery across organizational boundaries,
- providing reach-back support to forward responders who need expert assistance and information, making results and useful information publicly available, and
- suggesting government policy refinements to support cross-agency cooperation.

In addressing what are the special skills of an organization, it is also useful to consider what the organization is *not* expert at. It is clear that STAR-TIDES, for example, is not an organization seeking to sell products or make a profit. Thus, it does not need a sales force. Also, by and large, the organization is not conducting operations, such as providing forward, direct support or assistance to stressed populations. Rather, support is provided indirectly by building and communicating useful knowledge and technologies that will help decisionmakers and responders in the field to do their jobs more effectively. STAR-TIDES also is not an acquisition organization. It helps responsible organizations in choosing options that meet the needs of those in the affected areas who will have to live with and sustain the solutions. Equipment to satisfy these needs is then acquired through normal channels.

## Style

Style deals mainly with the leadership approach of the top managers in the organization. How do the leaders interface with subordinates and others in the organization, and how do members interact with each other? Style also incorporates the climate or culture of the organization, which can be expressed in terms of job titles, space allocation, workplace architecture, artifacts, and policies. It includes both the climate of the organization and the dominant leadership style. How does one effectively lead a collection of volunteers who are busy with many other commitments? Currently, the STAR-TIDES organization does this primarily by actively engaging the extended, open network via emails, phone calls, blogs, and face-to-face meetings to confront compelling problems. The climate is one of discovery and excitement in applying new ideas and technologies to addressing real-world challenges. Leadership is mainly focused externally—on raising the funds needed to sustain the organization, on the big problems the organization is

trying to solve, and on the extended, open network of experts and agencies whose help and cooperation is needed to solve problems.

Leaders in diverse, open-network organizations of mostly volunteers must rely more on relationships and shared common values and goals than on authority relationships to get things done. Volunteers cannot be ordered to do the work of the organization, but must be convinced, inspired, and at times cajoled. At the same time, leaders must manage internal staff functions and activities. In the case of STAR-TIDES, a small staff performs the essential, day-to-day tasks of the organization. Leaders must be flexible in balancing between accommodation and patience on the one hand and providing direction and setting clear tasks and deadlines on the other. They also may have to adjust their style quickly to match context and circumstances. Further, a style that works in one part of the organization may be ineffective in other parts. It is also critically important in porous network organizations that members are recognized for their contributions. People will stop participating or withdraw from the organization if they perceive that their contributions are not noticed and valued. There are many ways to recognize and reward contributions, ranging from simple email acknowledgments to more formal and public notes and awards.

In porous network organizations, electronic communications are an important means of transmitting the style of the organization. In STAR-TIDES, this happens primarily through email, although efforts are underway to move to more collaborative approaches. In addition to specific information, email messages can convey respect, courtesy, humility, individualized recognition, gratitude, and so forth. Alternatively, they can convey impersonal disregard for the sender. The same point applies to other communication forms, such as text messaging, telephone conversations and voice mail, and face-to-face conversations. When the organization is broad and diverse, with many participants never knowing each other beyond email or web communications, the form and style of these communications can have even greater impact. Some participants do not wish to receive multiple global email messages, or are only interested in specific topics and not others. Leaders need systems that convey and support the style they wish to see permeate the organization. For example, establishing simple methods for opting out of an email discussion thread, and discouraging the use of the reply-to-all email function may be effective ways to extend courtesy and respect for individual privacy. The other side of this coin is that participants generally want to be informed about whatever is going on in the organization, and don't want to be left out of the loop. Leaders in open network organizations thus also have a need for systems that help them strike the right balance between respect for privacy, and keeping all organization members fully informed. STAR-TIDES has many members who have expressed interest in various topics, but not all are interested in everything. Thus to reduce "spamming" of network members with emails on topics that don't interest them, and to maximize the use of their time, it's important to promote targeted information exchanges centered on topics of concern to participants.

## Shared Values

Shared values are the core beliefs in the organization about what is important and why the organization exists. They are incorporated in formal statements, such as a vision statement, and in informal expressions and practices around the organization. Shared values are the underlying principles or ideas that provide meaning and purpose in an organization. They are the basic values that, ideally, everyone agrees on, though the values are often unwritten, and agreement is

tacit. In an open network organization, shared values may be more difficult to identify across a large, diverse membership, but may be even more important to cohesion and unity of effort.

What are the shared values in STAR-TIDES? Perhaps the primary expressed shared value in STAR-TIDES is found in the organization's vision statement: "The STAR-TIDES coalition contributes effectively to building security and saving lives in stressed environments worldwide through building trust, information sharing, and cost-effective logistics." Implied in this vision statement are other values that bind people together in the organization. The first is a commitment to *solving problems through action, rather than dwelling on difficulties*. Solutions come through deliberate, thoughtful action.

A second shared value is a deep appreciation for *creative and innovative solutions*. The STAR-TIDES network seeks to be constantly alert to new technological developments, procedural improvements, and innovative ideas that can be applied to saving and improving lives. Another basic shared value is *open sharing of information* gained through the project. While there is certainly an appreciation for the importance of information security and individual privacy, in general the STAR-TIDES organization strives to be completely open with any information gained, and with the results of tests and evaluations. This value does at times have to be balanced against legitimate proprietary concerns of commercial participants, and with security concerns regarding information that could be used for nefarious purposes.

Also highly valued across the organization are *social relationships*. There is a generalized belief within the STAR-TIDES network that human social relationships are essential to accomplishing important goals. Related to this value is a shared value regarding the importance of communication, and also the critical role of ICT in enabling *effective communication*. While face-to-face communication is important, very often it is impossible. Good communication tools and strategies are necessary not only in responding to emergencies and crises, but also beforehand, in prevention phases.

These basic, underlying values in the STAR-TIDES organization are reflected in the vision statement, which emphasizes the three focus areas of cost-effective logistics through technological innovation, information sharing, and social networks.

## Alignment with the External Environment

Finally, the 7-S model encourages consideration of how well the organization as a whole is aligned with the larger external environment. This question is particularly relevant to the structure and strategy of the organization, but can also be asked with respect to the other 7-S factors (for example, how do the shared values of the organization align with values found in the external environment, and what are the implications?) As regards strategy and goals, those of STAR-TIDES are certainly well-aligned with the external environment, in that there is a widely recognized need around the world for more effective support for people in crisis situations, whether disaster, war-related, or simple economic deprivation. The STAR-TIDES goals also align well with changes in U.S. government strategic thinking since 2004, which places greater emphasis on all aspects of complex operations and on the need for greater cooperation across government agencies. The need for more information sharing, trust across agencies and groups, and affordable infrastructure solutions is great around the world. In its strategy to address these needs, STAR-TIDES is in close accord with this larger environment.

Also, it seems that a porous network organizational structure is well suited to a widely distributed, increasingly interconnected global community of diverse experts.[13] Despite the inherent mutability and other difficulties associated with porous network structures as compared to other forms (e.g., divisional or functional), they have some distinct advantages. Porous networks are more open to new ideas and technologies, and more likely to identify useful developments and connections or synergies. In addition, porous network structures may have an adaptive advantage over other structural forms, in that they are better able to sense trends and shifts in the external world, and quickly respond and adapt to such changes.

Porous network organizations such as STAR-TIDES are increasingly common in the global environment. By applying a 7-S model analysis to their own organizations, leaders can quickly identify areas of strength as well as potential weaknesses. Regardless of the type of organization, leaders can benefit by considering the extent to which these seven key elements align with each other in the organization and with the changing external environment.

---

[13] See, for example, Linton Wells II, et al., *STAR-TIDES and Starfish Networks: Supporting Stressed Populations with Distributed Talent*, op cit.