January 26, 2010

From Haiti to Helmand: Using Open Source Information to Enhance Situational Awareness and Operational Effectiveness

Summary: Open source information and distributed collaboration made significant contributions in Haitian earthquake relief to enhance situational awareness and support operational needs. They can help build sustainable capabilities going forward. They also are contributing daily in Afghanistan, but could do more. What's needed is to:

1. Have U.S/ and coalition authorities recognize the value of these kinds of UNCLASSIFIED, "outside the wire" activities and the information they generate;
2. Establish ways for decision-makers (government and non-government) to access and use such information, tailored to different security environments and missions; and
3. Assign points of contact (POCs) as "Open Source Teams" to engage with the civilian technology community in ways that provide value for all sides.
4. Provide ways to turn innovative information sharing into completed "transactions" (delivered supplies, rescued people, sustainable development, etc.)

This paper suggests how distributed collaborative approaches from Haiti could be applied in Afghanistan, and describes some Afghan information-sharing initiatives.

Observations from Haiti: Within hours after the earthquake, individuals and teams from open-source civilian technology communities,[1] as well as large and small businesses, began leveraging a wide array of distributed expertise through global networks of volunteers. Crowdsourcing[2] and open-source capabilities were used to a greater extent than in any previous disaster to accelerate insights into what happened where, who needed help, and who could provide it. Enough examples emerged to suggest a new model of public-private and trans-national cooperation (notionally termed C2G – citizen to government) to enhance situational awareness and target responses. For example:

- Relief workers received messages in Kreyòl which they didn't understand. Using Skype, text messaging and other tools, they reached out to Kreyòl speakers around the world for translation support. To interpret messages like, "People trapped in building by school next to fountain," a distributed network with local knowledge of Port au Prince converted such information into street addresses, which were converted to GPS coordinates, which were passed to search & rescue teams.
- The Coast Guard was getting operationally useful information based on data compiled by graduate students in Boston, using the open source situational awareness tool Ushahidi (developed in Kenya), based on data transmitted and translated as described above,

[1] These included: CrisisMappers, InSTEDD, Google, Ushahidi, Sahana, OpenStreetMap, SMS, UN-SPIDER, ICT4Peace Foundation, etc. See http://star-tides.net/node/653 .

[2] Crowdsourcing, here, is shorthand for a variety of open-source, social-media-enabled, approaches to take advantage of the collective wisdom of large groups. Technologies used range from blogging to SMS text-messaging, from social media platforms (Twitter, Facebook, hi5, others) to the integration of open source data onto satellite base maps.

 Lin Wells wellsL3@ndu.edu, 202 436-6354, Ralph Welborn, ralph.welborn@gmail.com, 781 727-8339

superimposed on imagery processed at San Diego State's Visualization Lab, and overlaid with OpenStreetMap (OSM).

- Imagery (satellite and aircraft) was rapidly distributed, updated with on-the-ground mapping capabilities and fed back to the responders to help target high-need areas. Shared imagery was invaluable.
- The SMS 4636 text messaging code was deployed in days to help route info to disaster support centers. (see, for example, http://star-tides.net/node/623)

In parallel, US Southern Command responded quickly and effectively to incorporate the insights flooding in from such open source efforts. The command designated POCs for unclassified information sharing ("Open Source Team"), fell in on a platform (All Partners Access Network—APAN) to facilitate collaboration "outside the wire," and worked to share their data with the civilian technology community on a reciprocal basis.

Observations from Afghanistan: Open source information can offer much in Afghanistan. Despite cultural variations imposed by the tyranny of geography, severe security concerns, and diverse mission objectives, significant open source information is being shared in Afghanistan "outside the wire." Nangarhar Province offers many examples of pilots and projects, some stemming from the fact that San Diego and Jalalabad are Sister Cities. But the approaches can be applied elsewhere in Afghanistan, including Helmand Province, tailored to local conditions.[3] Such efforts include:

- Aggressive outreach to promote information sharing among diverse parties (NGOs, PVOs, Afghans, public health officials, etc.) in Jalalabad and nearby villages.
- Establishment of local wi-fi networks to support tele-medicine in Jalalabad and its environs. In many cases, antennas to support the network have been made by young Afghans, using wood, wire mesh, commercial routers and electrical tape.
- Use of SMS text-messaging to provide rapid updates to Geospatial Information System (GIS) base maps to enhance situational awareness – used during the August 2009 Presidential election.
- Sending 'one-laptop-per-child' computers under the San Diego-Jalalabad initiatives.

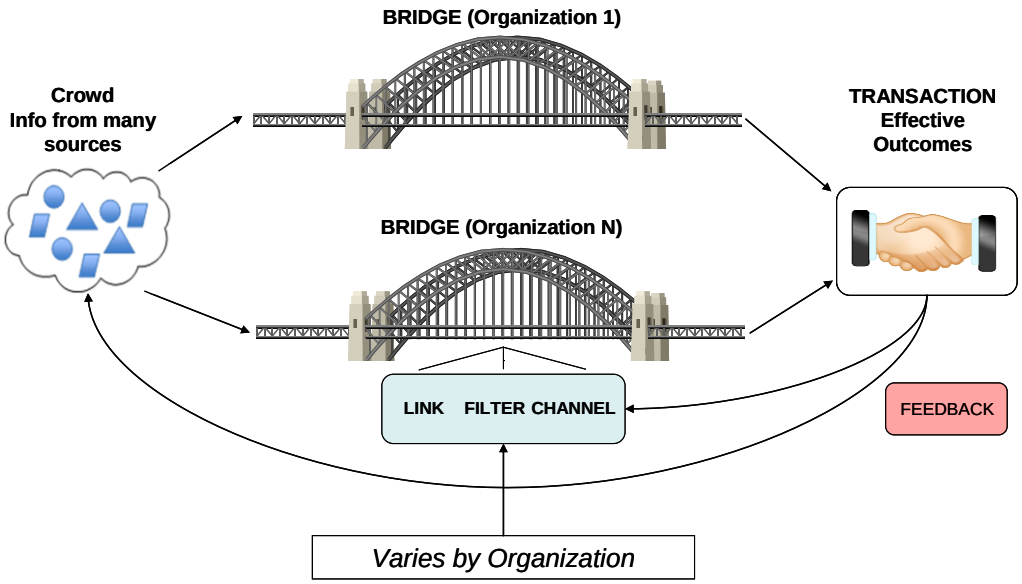
Various field experiments are being conducted to enhance the value of open source GIS tools and distributed collaboration.[4] These can be applied in Afghanistan.

[3] Linton Wells II, Expanded Access to Information in Nangarhar Province, 21 Feb 2009, http://star-tides.net/node/380 .

[4] John Crowley, Camp Roberts August 2009 Report, http://star-tides.net/node/600. See also the many activities of the Crisis Mappers group: crisismappers@googlegroups.com.

A Simple Framework to Take Advantage of Open Source Information: The figure below shows a framework by which decision-makers can take advantage of open source information, in a variety of security environments.

Crowd, Bridge, Transaction, Feedback Model



- The ***Crowd*** includes information from many sources— NGOs working the field, news organizations, crisis-mappers, text-message feeds, other social media sources, etc. It will exist whether government officials, or others, use it or not. However, it's important to make it easy for people to find what they need.

- The ***Bridge*** between the "Crowd" and "Transaction" is uniquely designed for each organization and incorporates elements such as:
  - A ***Link*** where "Open Source Teams" pull together information from the cloud they want to monitor—blogs, wikis, structured GIS products with metadata, collaboration tools, text-messages, etc.
  - A ***Filter*** where information is vetted and validated. Depending on the security environment this can be a light review (Haiti) or, in some cases (Afghanistan) the open source information will have to go through rigorous scrutiny.
  - A ***Channel*** through which filtered information is passed to decision-makers of whatever stripe.

- The ***Transaction*** represents an outcome that's been achieved effectively: Something valuable on the ground has occurred (people rescued, food delivered, contracts fulfilled, etc.). Without the completed transaction, "Crwod" and "Bridge" are just interesting exchanges of information.

- ***Feedback*** loops connect the "Transaction" to the "Bridge" and the "Crowd." Feedback is essential not only to know which Transactions have been effective, but also to identify those that have not. Besides being able to affect individual organizations, broadly directed feedback can produce pressure that can change the environment in which decisions are made (through embarrassment via the "Crowd," for example) to improve the likelihood of successful Transactions.

Although the framework is simple, taking advantage of the enormous (and growing) amount of useful information "in the crowd" requires that leaders do three things:

- Recognize its potential value, assign points of contact, develop a structure to take advantage of it, and encourage two-way information flows through social networks.
- Adjust their organizations to set up the "link, filter and channel." The bridge will require a "platform" to collect, manage and display the information—US Southern Command uses APAN. ISAF in Afghanistan is using harmonieweb. Other platforms are available, and both APAN and harmonieweb will have to evolve to take full advantage of the huge amounts of structured data the cloud produces. INDURE (International Distributed Uniform Reporting Environment) is being developed as an UNCLAS activity data base in Afghanistan.
- Set up links to people and organizations "outside the wire" to allow for "transactions" to happen that can have an enduring impact among the affected population.

Recommended Steps Forward for Afghanistan

1. Use the information now available in Nangarhar to feed into the Integrated Civil-Military Campaign Plan through a framework like the one described above.
2. Evaluate these approaches for applicability in Helmand and elsewhere in Afghanistan.
3. Pay more importance to information and telecommunications "outside the wire." Too often, in Afghanistan they have been considered neither critical infrastructures nor essential services.