PEER-REVIEWED JOURNAL ON THE INTERNET

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by Calvert Jones and Sarai Mitnick

Open source disaster recovery: Case studies of networked collaboration

Abstract

Volunteers eager to help disaster victims have begun to draw on open source models of organization to mobilize and coordinate vast resources from around the world. This paper investigates two such groundbreaking efforts, involving responses to Hurricane Katrina and to the South East Asian tsunami. The study sheds light on how these organizations evolve so rapidly, how leaders emerge and confront challenges, and how interactions with traditional, more hierarchical disaster recovery efforts unfold. Lessons from these early efforts show how they can be improved, and also point to the need for more research on networked non–state actors that are playing increasingly prominent roles.

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Introduction

In the aftermath of recent disasters such as Hurricane Katrina in August of 2005 and the Southeast Asian tsunami of December 2004, efforts began at aiding recovery through the medium of the Web. In addition to the online endeavors of formal aid organizations, these recovery efforts included attempts to provide help through collaboration amongst distributed networks of volunteers. Although providing relief after a natural disaster is generally capital intensive and requires the resources of large organizations, some types of disaster assistance seem a prime target for these kinds of open source style projects. Data–driven relief, such as identifying resources, coordinating assistance to victims, publicizing services, and establishing communication standards are all areas of assistance where open collaboration might thrive.

This paper examines two of these recent efforts. The first case is the Katrina PeopleFinder Project (http://www.katrinalist.net/), a project aiming to aggregate missing persons' information following the hurricane.

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The second case is the South–East Asia Earthquake and Tsunami Blog (http://tsunamihelp.blogspot.com/), a high–traffic information resource that appeared in December 2004. We explore how these projects developed, their methods of coordination and participation, and how they interacted with individuals and organizations to provide services to victims. We also investigate the ways in which their decentralized approach to information gathering and sharing was helpful, and in what ways it proved less successful.

PeopleFinder

Following Hurricane Katrina, notices about missing persons began appearing on numerous Web sites, such as Craigslist (http://www.craigslist.org/about/help/katrina_aid.html), the Red Cross Web site, and Yahoo! While this information was prevalent and potentially valuable to those searching for survivors, the scattered sources made it difficult for any one individual to locate relevant information. The Katrina PeopleFinder project hoped to address this challenge by creating a single data format, and providing a central database of missing persons information harvested from across the Web.

Development and coordination

On 1 October 2005, David Geilhufe of the Social Source Foundation began an installment of blog posts detailing the history of the PeopleFinder project. In "Personal history of the Katrina PeopleFinder Project PART I," Geilhufe wrote that the project began when he agreed to assist in installing CiviCRM, a non–profit constituent relationship application developed by Social Source, for the New Orleans Network Web site (http://www.neworleansnetwork.org/). According to his personal account, the purpose of the CRM would be to power a "people finder" section of the site, like others around the Web, to connect hurricane evacuees. Geilhufe soon began questioning the efficacy of building another small–scale solution, and instead explored the idea of aggregating evacuee information from sites across the Web.

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On Friday, 2 September, Geilhufe began to enlist help from colleagues in order to build a standard data format, soon known as the PeopleFinder Interchange Format. He received assistance in writing the specification from Ka–Ping Yee, who he calls the "Godfather of the PeopleFinder Interchange Format (PFIF)," and Jon Plax. To gather support, he began spreading the word via e–mail among his own social and professional network. Early on 3 September, he sent an e–mail seeking assistance in organizing the manual entry of data from disparate sources. He writes, "Andy Carvin, Marty Kearns and Deborah Elizabeth Finn got the first e–mail. Kieran Lal and Zack Rosen from CivicSpace Labs were already involved and they brought in Steve Wright from the Salesforce Foundation." [1]

The project participants coordinated via an e–mail list (katrinadev) and soon began using the globalvoices channel on irc.freenode.net. Ethan Zuckerman led the technical effort of assigning chunks of unstructured data to volunteers and on Saturday, 3 September, a wiki was set up for this purpose at katrinahelp.info. The project began to receive attention from several popular blogs, and soon PeopleFinder was overloaded with volunteers. A decision was made to halt data entry, pending the development of a stronger back end. The Salesforce.com Foundation agreed to provide both the search engine and back end database. Geilhufe writes, "I felt it important to get a big corporate player involved in the hopes that they could move resources latter [sic] on in the process, though their technology is pretty cool too." [2]

In a subsequent blog entry entitled "Katrina PeopleFinder Metrics" [3], Geilhufe reported that by Monday, 5 September, there were 10,000 missing and found person records entered into PeopleFinder. Nearly a month later, Geilhufe reported that the database contained 649,015 entries, and that over one million searches had been performed. He estimates that there were roughly 3,000 volunteers contributing to the effort.

Collaboration

Geilhufe writes of the effort, "The relationship between PeopleFinder coordinating organizations (Social Source Foundation, CivicSpace Labs, and the Salesforce.com Foundation) and katrinahelp.info is part of what I call Web 2.0 Collaboration. People, technology and organizations whose default position is trust ... whose first question is 'how can others leverage what I'm doing' rather than 'how can I protect myself from other leveraging what I am doing'." [4] The collaboration he describes includes not only individual participants, but also non–profits and corporations, who may provide additional resources or organizational advantages. PeopleFinder recognized the advantage of corporate resources and allied itself with Salesforce.com in order to gain access to better software and a more robust back end. *Discover* magazine reported, "PeopleFinder was the kind of data–management effort that could have taken a year to execute at great expense if a corporation or a government agency had been in charge of it. The PeopleFinder group managed to pull it off in four days for zero dollars" (Johnson, 2005). In fact, it was necessary for PeopleFinder to collaborate with existing organizations such as Salesforce.com to provide their service.

There is also evidence of tension between the project and existing organizations. Project leaders were hesitant to form a relationship with the Red Cross, whose database was built with assistance from Microsoft. Jon Lebkowsky writes in the Smart Mobs blog, "Marty Kearns of Network Centric Advocacy encouraged the PeopleFinder project to throw its data to Red Cross and to push for the Red Cross site to be the single authoritative search for evacuees and other Katrina victims, and family and friends searching for them. Marty's suggestion implied a difficult question: should the PeopleFinder project end?" (Lebkowsky, 2005). The Red Cross site had the obvious advantage of an authoritative name that users would turn to in crises, and the decision was finally made to turn over the data. Project developers debated whether to continue the data entry efforts, and after a brief hiatus, resolved to continue. Interestingly, neither David Geilhufe's nor Ethan Zuckerman's detailed accounts of the project's development mention this debate over giving up data. Perhaps the issue of trust and decisions over data sharing are more complex than the message of open collaboration they present.

Geilhufe sees an infrastructure for communication to be crucial to the type of collaboration he describes. "Communities exist all over the world and in cyberspace and just need a little infrastructure to catapult them into highly effective entities. That infrastructure of communication and simple directories of what is available needs to be distributed rather than centralized." [5] Data standards provide a means for information exchange and facilitate this style of collaboration, by allowing individuals and organizations to use others' data with less effort. Hence, the first step for PeopleFinder was the development of the PFIF standard, demonstrating the project's focus on inter–organizational collaboration and data sharing.

Participants

The first participants in the organization of PeopleFinder were gathered via direct e–mail from Geilhufe, indicating that the project originated within an existing network. Technical lead Ethan Zuckerman writes, "Many of the people who are working on chunks of the PeopleFinder project are people who've known each other for years — sometimes in person, sometimes virtually — and trust each other a great deal. Most of the people I reached out to for help on coding problems are people I've known and worked with for over a decade. Many of the first volunteers who started entering data into the system — and who debugged our first data entry problems — are part of an extended LiveJournal community" (Zuckerman, 2005). The project grew from this initial network of individuals. "By the time database melted down, people I knew were in the minority." While the growth of the project and its extension outside of the small network was an important outcome, having a base of knowledgeable, interested, and connected participants was critical in building the initial response quickly.

[redacted]

Zuckerman writes,

"Basically, when net people try to solve a problem, they bring their posse with them. For me, one of the lessons of the weekend was discovering what a powerful force my posse can be, and how effective the network of posses around the net can be."

Zuckerman writes that "None of us were prepared for the volunteer turnout." The large number of willing and interested participants was unexpected and the large number of users sometimes disabled the system entirely. Many of these volunteers arrived at the project through its promotion on blogs such as BoingBoing and Metafilter. Zuckerman writes, "Basically, when net people try to solve a problem, they bring their posse with them. For me, one of the lessons of the weekend was discovering what a powerful force my posse can be, and how effective the network of posses around the net can be."

South–East Asia Earthquake and Tsunami Blog

One particularly well–known site among the range of online resources that emerged following the disaster was the South–East Asia Earthquake and Tsunami (SEA–EAT) Blog, launched within hours of the 26 December 2004 tsunami. Initially intended "just to spread information" about the tsunami, in the words of one organizer, it evolved into a major grassroots clearinghouse for disaster relief and recovery [6]. Within eight days, a Google search of "tsunami" ranked the site third and it had recorded at least a million page hits, its counter having overloaded. It rapidly became a very popular "one–stop–shop" for news and information about the disaster, including first–hand accounts, questions from abroad about missing friends and family, calls for help, offers to assist, and summaries of mainstream news coverage with links to the full articles.

Purpose and organization of information

One main purpose of the blog was to aggregate news and information at a time when the mainstream media's coverage was seen as fragmented and insufficient [7]. The organizers were overwhelmed by the number of comments that accumulated in the first few weeks, serving the blog's purpose in this capacity. These comments consisted largely of news reports with links to the full articles in the mainstream media, such as:

> Powell Says Tsunami Relief Should Be a Long–Term Project
>
> Secretary of State Colin L. Powell said today that the response to the Indian Ocean tsunami should be considered a long–term project that could extend far beyond the current efforts to provide immediate relief to survivors.
>
> Interviewed on a series of news shows, Mr. Powell said that he will meet with President Bush on Monday to review his recent trip to tour several of the nations hit hardest by the catastrophe that has claimed an estimated 150,000 lives. Asked on the ABC News program "This Week" what his recommendations to the president would be, Mr. Powell said: "That we stay engaged. That this is a long–term prospect."
>
> Read the Full Article at The New York Times (requires free registration)
> [–] Collapse this post
> Bala at 1/9/2005 04:03:22 PM | 0 comments | Post a Comment | Want to help? |

In addition to these kinds of posts, the blog contained more first–hand information from journalists and volunteers delivering assistance to victims. According to one volunteer working on the blog, “We’re getting out information that traditional media has not access to” [8].

Yet this citizen journalism function rapidly expanded beyond information dissemination into a more interactive, decentralized attempt to identify and allocate recovery assistance. In the BBC’s coverage four days after the tsunami hit, Dina Mehta, a lead organizer, indicated that the blog was not intended for first–hand accounts of the disaster. Instead, she explained, “What we’re doing is we’re building a resource ... .Anyone who says, OK, I want to come and do some work in India, volunteer in India, or in Sri Lanka or Malaysia, this is the sort of one–stop–shop that they can come to for all sorts of resources — emergency help lines, relief agencies, aid agencies, contacts for them etc.” [9] It is not clear, however, how other volunteers viewed the blog’s shifting purpose, as it evolved from pooling news coverage to enabling humanitarian intervention. Given the collaborative, networked nature of this undertaking, research that delineates and compares all the volunteers’ views of the blog’s purpose would uncover how cohesive the movement was, and build knowledge of networked movements in general.

As awareness of the SEA–EAT Blog widened, with Google linking to it and providing unlimited bandwidth, local NGOs, international NGOs, and individual volunteers from around the world began to post comments seeking and offering help, conforming to Mehta’s conception of the blog as an interactive resource rather than news aggregator. This is an example of a call for help:

> We Need Volunteers — An Appeal By Tamilnadu Tsunami Relief Initiative
>
> — We need volunteers for on the spot assessment of the affected villages for rehabilitation efforts, we need volunteers to coordinate these assessment, document the same
> — Need volunteers to do counselling with the victims, be available and talk to them, women volunteers are most welcome
> — Need volunteers to coordinate and assist on–field activities at thiruvarur and sirgazhi
> — Also volunteers for sorting out materials, packaging and labelling them at Gandhi Study Centre and also KFI–the school.
>
> ---
> Tamilnadu Tsunami Relief Initiative
> CONTACT INFO:
> ---
> Samanvaya:Knowledge Services for the Development Sector —
> www.samanvaya.com
> [–] Collapse this post
> sakreha at 12/31/2004 11:22:57 AM | 123 comments | Post a Comment | Want to help? |

People who responded to such calls for help in the section for comments generally emphasized their relevant skills and experiences along with their availability and contact information. Below is a set of excerpted comments answering the Tamilnadu Tsunami Relief Initiative’s call for help, illustrating the diversity in background of the respondents.

> I am a 22 year old recent graduate from Baylor University in Texas. I saw your need for female volunteers to help counsel victims of this horrible tragedy. I have no training in counseling but love people and am willing to help in any way i can. I will be honest and say that my finances are extremely limited, and i have no idea how i can get from here to there, but my heart hurts for these people. Please let me know if there is anything that I can do to help.
>
> I am currently in Aberdeen, Scotland doing some Ph.D. research. I am an ordained minister with background in insurance, basic building, organization and administration, counseling, and other various skills. I would like to travel to India or any other area affecteed by this disaser to help out in any way I can be best utilized.

> Hi i'm ... from Hamburg, germany and i would like to help. i got a gap until march and would pay my own expenses. I have experience in carpentry and am physically fit for doing anything.
> could approach as soon as i'm needed.
> be strong.
>
> I am available to volunteer right away as well. I am physically fit, 36, female, college graduate, with major in psychology. Please let me know if I can help out.
>
> Hi, I am a newly qualified registered nurse from South Africa, willing to assist in any way that I can. Am provicient in emergeny care and trauma councelling. May need assistance with airfare.
>
> I am a 16 year old Student living in England and I am willing to help out in any way I can. I am willing to fly out in July, but in the mean time anything I can do to help here will be no problem.
>
> Hi, I am a 27 year–old girl, living in Denmark. I have a bachelor in psychology and would be happy to work with counselling the victims, if there is an opportunity. I have lived in India, in Gujarat before, for about 5 months, so I have some knowledge of the country and culture as well.
>
> My husband and I are both physicians in Providence, RI. He is a pathologist/neuropathology fellow. I am a plastic surgery resident. We are both also able to provide primary care and first aid. We are not limited to helping with just medical issues. We both speak English and a small amount of Spanish. I can speak some Korean. ... We are available the first week of Feb 2005.
>
> Hi. [I am] 37 yrs old and ... living in the Philippines. I would like to help as a volunteer. I am a chemist and have excellent organizational and interpersonal skills. I can leave anytime to help out.
>
> Hello ... I am a 22 year old American woman with a degree in Geology. I have months of free time available right now and I am determined to help in any way I can. Please e–mail me ... any information you can offer me. Thank you!
>
> i'm a student of philosophy with out funds to help but with time and will. i realy would like to help to rebuilding the houses, hospitals, schools. i like to now how can i get there with out pay all of the expenses because i'm in portugal.

In these comments, contributors seemed to have exhibited a wide age range, with one as young as 16, and a fair amount of variety in their nationalities, skills, finances, and educational backgrounds — from the impoverished philosophy student in Portugal to the South African registered nurse.

Posts like these, including news reports, calls for help, and offers to assist, multiplied rapidly on the blog, leading Griffin, Mehta, Gupta, and the other volunteer–organizers to seek a more efficient means of organization. They had used Google's blogspot.com to begin with because it was a platform familiar to them, but its limitations grew apparent as content swelled. Specifically, the blog organized comments in reverse–chronological order and did not support categorization, making it difficult for visitors to find the information they needed. In response, the organizers divided up the comments into "sub–blogs" for particular categories of information, such as Tsunami Enquiries/Helplines/Emergency Services, Tsunami Missing Persons, Tsunami News Updates, Tsunami Help Needed, Tsunami Help Offered. In the new template, the main page of tsunami.blogspot.com linked to these sub–blogs.

Despite their efforts, the sub–blogs exhibited the same problems of organization as the blog did as a whole, and the volunteers ultimately decided to shift all content to a wiki. Dina Mehta explained that in "hindsight I wish we had set up the SEA–EAT (South–East Asia Earthquake and Tsunami) blog on a wiki instead. It was such a quick and spontaneous decision that we just wanted to get on with building the resources rather than fuss about the platform." [10] In her view, the wiki provided a better platform because it could present information in a faceted collection linked by category, with any participant able to create separate page. However, Rohit Gupta, another lead organizer, voiced some concern about the rationale, because "In the wiki, individual contributors are invisible most of the time ... Showing that you're contributing is a huge motivation factor in a blog. A natural step for us is to move onto a wiki, but I don't think that we could have come as far as we did on a wiki" [11] In the end, the blog was maintained with a sidebar of links to relevant categories of information organized on the associated wiki.

The role of leadership

News reports offer vague, occasionally conflicting accounts of who actually established the SEA–EAT Blog. For example, the *Indo–Asian News Service* reports that Mumbai–based blogger Dina Mehta, a qualitative researcher who runs a research consultancy on brands, along with "two of her friends" launched it, while *Information Week* asserts that "the blog was started by Peter Griffin, a writer and blogger located in Mumbai, India." [12] *Investor's Business Daily* reports that Zig Zackly (the name of Peter Griffin's blog) launched it "with a few computer–savvy friends," and *India Today* attributes it to Griffin, Mehta, and Rohit Gupta, another Mumbai blogger, all working together (Tsuruoka, 2005; Doshi, *et al.*, 2005). Finally, the *Hindu* reports that information systems designer Paola di Maio, not mentioned in any of the previous articles, set up the blog with the assistance of Griffin, Mehta, and "other Internet enthusiasts in the region" (Barkham, 2004b). These ambiguous attributions reflect a decentralized, collaborative approach, with volunteers each contributing their part to the blog's establishment and maintenance.

Dina Mehta's own account attributes the original idea to Peter Griffin (Mehta, 2005). According to her explanation, shortly after Griffin launched the blog on 26 December, he invited her and Gupta to collaborate with him in developing the resource. Although Griffin, Mehta, and Gupta knew one another through their Mumbai blogging networks, including the World Changing blog, they had never met in person when they began collaborating. Within a few hours of the time Mehta and Gupta signed on, New Jersey–based blogger Bala Pitchandi joined the team. Having survived the tsunami in Phuket, Thailand, Paola di Maio also e–mailed the group requesting to help out. Responding to the authors' question about leadership, Pitchandi recalled that Griffin and Mehta handled "Media Relations in India" and "general blog related efforts," while he was the "central coordinator" of "various efforts including the Blog, sublogs, the wiki & other technical groups," as well as media relations in the U.S. [13] In his answer, he also listed other "key people" in the SEA–EAT team, along with informal titles indicating their areas of expertise: Constantin Basturea ("The Tech Guru"), Neha Vishwanathan ("The Wiki Expert"), Megha Murthy ("The Template Queen"), Angelo Embuldeniya ("Jack of All Trades"), and "many others." Within a few days, the number of volunteers working on the project rose from the original three to over 200.

The evolving roles of Griffin, Mehta, Gupta, and Pitchandi as leaders, however, are unclear from the limited news coverage of the blog's development, and may in fact be nebulous or inconsistent in their own minds. Rather mysteriously, Gupta told the authors that "I was under a spell, and now I'm out of that spell. I have a very faint idea what happened, how it happened, and why I was a part of it. But it did happen." [14] In Mehta's account, Paola di Maio is not mentioned, even though she is portrayed as a lead organizer in the *Hindu*, *Guardian*, and *New Zealand Herald* [15]. Di Maio is also absent from Pitchandi's remarks about leadership, although in her section on the Contributors Page for the katrinahelp wiki — another collaborative online response to a disaster — she says that "I was the technical lead for Tsunami Help Blog during the first week of development." [16] Her own account of the blog's development, "Tsunami Help Blog: Developer's Notes," reports her role as "tech lead," with Griffin and Mehta having "central responsibilities" for coordinating the blog and "things" (di Maio, 2005). Her absence from Mehta's and Pitchandi's accounts could signal anything from a lack of awareness of her contributions; collaborative feeling that "everyone was a leader"; lower opinion of the significance of technical leadership; to internal conflicts over control of the blog. Leadership in such a networked movement deserves further study given the patchiness of this picture.

Division of labor: A self–organizing process?

According to Mehta, di Maio, and Pitchandi, volunteers self–organized into teams devoted to maintaining, adapting, and updating the blog and later wiki. Sounding very much like an open source advocate, Mehta recalled that "There was no formal organization, no CEO or CTO or COO We adopted roles depending on our experience and skills. We made commitments voluntarily. We rounded up people who we felt would help us in performing our roles better" (Mehta, 2005). For example, when the volunteers decided to categorize the information on the blog into sub–blogs (such as "Help Offered" and "Help Needed"), they "self–organized into action" (Mehta, 2005). Di Maio provides a more detailed explanation of this process, highlighting how initial coordination problems led the volunteers to "centralize" their communication so they could organize themselves more effectively. Their initial reliance on emails meant that efforts were being duplicated and overlooked, with volunteers complaining that they would spend hours working on a template only to see it deleted later. As a result, they established a mailing list and used Yahoo messenger to facilitate coordination. As Di Maio put it:

> All decisions that pertained [to] the work group were discussed on the list. If somebody had an idea, and wanted to do something, [he or she] posted a note to the group via the list 'I am planning to do that.' Not only [did] the group had [sic] an opportunity to comment and contribute to such idea, but anyone with key skills who could have contributed to the development of the project would have an opportunity to offer their services or criticism ... everyone was able to pitch in and participate to a task based on their availability and expertise or spur of the moment enthusiasm. (di Maio, 2005)

Moreover, the group established a set of guidelines for participation on the list and the overall division of labor. These guidelines identified roles, such as linkers, janitors, and monitors, and listed their responsibilities. Linkers were responsible for adding links for the sub–blogs (categories) to the sidebar on the main page. That task required micro–coordination of labor because if attempted while other changes were being made, those changes could be lost. Therefore, the document instructs the linker to "inform everyone when s/he is about to make any changes. Everybody stops posting. LINKER makes changes, saves, publishes, checks the site, then gives an All Clear so people can start posting again." Janitors and monitors cleaned up posts by correcting spelling errors, making links clickable, and so forth, and gardeners transplanted information from the blog to the wiki. Di Maio described this division of labor as a combination of "people doing what they were comfortable with" and "people doing what the coordinators asked volunteers to undertake" (di Maio, 2005).

Most first–hand accounts of this process paint a picture of smoothly self–organizing collaboration, without significant conflict or confusion. Pitchandi was "amazed how totally unfamiliar people from all walks of life and from all over the world could 'self–organize' themselves so well." Mehta asserted that teams "just self–organized into action" (Mehta, 2005). Griffin called the collaboration "miraculous," adding that "The team that worked on this site just sprang into being" (Griffin, 2005). Yet the collaboration did not "just happen" among strangers who suddenly sprang into collective action. Many of these volunteers already knew one another through their online social networks, including the lead organizers, and their sense of community likely gave the project a stronger foundation, making it easier to "self–organize." As Mehta said, "We rounded up people who we felt would help us in performing our roles better," suggesting that volunteers called upon their own extended networks for help (Mehta, 2005). Although outsiders clearly participated as well, the blogger community facilitated the division of labor.

Hints of conflict in the accounts of Mehta, Pitchandi, and especially Paula di Maio also belie the idea that this self–organizing division of labor happened without a hitch. Mehta vaguely refers to a "clash in philosophy where a few were under the impression that this was going to be a formal organization." This clash was "Dealt with by different members of the group at different times in different ways ... in some cases gently, in others more harshly with the group turning upon the dissident" (Mehta, 2005). Who was the dissident and why did he or she disagree? What circumstances led some members to deal "gently" and others to "turn upon" the dissident? Mehta provides no further explanation, and Pitchandi, who admitted that "handling interpersonal issues in such a diverse group" was a challenge, did not elaborate. Di Maio's "Developer's Notes" add a bit more to the story:

> Occasionally someone would create/change/invent/pursue ideas without discussing them on the list, so that the majority of volunteers started ignoring things that were happening. This created potential problems and started eroding the collaborative potential of the group. While all new creative lines that could develop the blog were encouraged, it was essential that volunteers remained available to manage and maintain the information that was being generated, which was copious and needed constant monitoring, if not even editing. (di Maio, 2005).

She goes on to write that ideas pursued without first consulting the group list interfered, not surprisingly, with overall coordination and prioritization of tasks, with "personal" ideas being pursued at the expense of more basic work necessary to keep the blog running efficiently. Her comments suggest that as the number of volunteers grew, the list together with its guidelines and norms fulfilled an increasingly important referee function, mediating the volunteers' various interests and ideas for developing the resource and obliging them to follow through with tasks. A more detailed investigation of these conflicts, highlighting how they arise and unfold with more systematic qualitative input, would help demonstrate how collaborative potential waxes and wanes in volunteer networked endeavors.

Coordination of resources for disaster relief

How well did the decentralized efforts of these volunteers actually provide recovery assistance in the tsunami's aftermath? In their discussions of the blog's value in disaster relief, the lead organizers rely on a rationale similar to Yochai Benkler's argument highlighting the major advantages of commons–based peer production, based on decentralized information gathering and exchange. Specifically, this model of production "places the point of decision about assigning any given person to any given set of resources with the individual" (Benkler, 2002). The idea is that individuals may be best positioned to know their own skills and local sets of resources, and connect them with particular tasks if those tasks are clearly spelled out.

When local NGOs and other relief providers began posting offers for help in the blog's "Help Needed" section, the organizers hoped the specificity of these calls and the tasks they described would rapidly attract volunteers with the right skills and availability. Likewise, they hoped that when volunteers posted their skills and resources in the "Help Offered" section, those in need would be able to rapidly find the right fit. Plenty of comments suggest that this matchmaking was attempted. In response to the Tamilnadu Tsunami Relief Initiative's call for help, for example, one volunteer specifically explained how his skills might contribute to the particular tasks described:

> hi sakreha,
> you say you require :
>
> "We need volunteers for on the spot assessment of the affected villages for rehabilitation efforts, we need volunteers to coordinate these assessment, document the same"
>
> I'm a soil scientist with expertise in land and sanitation. I furthermore have a trade with skills in mechanical engineering. As I'm currently in India (New Delhi) having fortunately crossed over and up from Pondicherry 8 day before the disaster I write to see if my skills are useful. ... you can gain further details of my skills from my web site ... If I can be of use please advise as I am in the vicinity and am available.

Even though the blog may have enabled this kind of matchmaking, however, it is not clear how often it actually took place. The proliferation of online hoaxes related to disaster relief donation demonstrates one potential problem with this matchmaking — the degree of trust among participants, and the absence of a mechanism to convey the credibility of posts. Also, two people who posted offers to assist reported that their offers were never answered, and that posting their e–mail addresses on the site invited spammers to flood their in–boxes [17]. Their emphasis on their posts having not been *answered* suggests another potential problem, a disconnect in how people understood the blog's coordinating function. The organizers appear to have viewed the blog as a resource, a "one–stop–shop" for individuals to figure out for themselves how volunteer efforts could assist victims. Mehta emphasized that "We give *them* the whole resources, avenues to contribute ... ." (emphasis added). She clarified that "We're not really doing the relief work. It's just intended to be a house for all resources, so people don't have to run around looking everywhere" (Moore, 2004).

In this way, differing expectations about the blog's role in coordinating efforts may very well have hampered effective disaster relief.

Yet the two volunteers whose comments were never answered suggested that they were waiting to be contacted and told how to help. Others who posted in the "Help Offered" section may have also expected people to read their posts and e–mail them individually, either the people in need or the blog organizers. They may have expected a more centralized system that would direct them to the proper channel where their efforts would be most valuable, rather than the decentralized process of resource identification and allocation that the blog organizers envisioned. In other words, it may be that users expected someone else to contact them to say "OK, you can go do X," rather than having to "self–organize" and sort through the comments themselves, taking the initiative to find out how to link their skills and resources with disaster relief needs. If volunteers held this view, then it might not have mattered that larger groups of individuals could scour larger groups of resources, another advantage Benkler associates with commons–based peer production, because everyone would be expecting someone else to take the initiative. In Benkler's language, the cost of integration may have been too high.

In this way, differing expectations about the blog's role in coordinating efforts may very well have hampered effective disaster relief. If volunteers who posted in "Help Offered" expected those in need to contact them, and at the same time those who posted in "Help Needed" expected the volunteers to contact them — or if both groups expected the blog organizers to match them up appropriately — then very little assistance is likely to have been provided, despite widespread willingness to contribute. Quantitative research investigating to what extent these volunteers actually used the blog to match their skills and resources with needs, and how good those matches were in practice, would help clarify the blog's effectiveness in identifying and allocating resources for disaster relief.

Conclusions and further research

These attempts at open collaboration for disaster recovery demonstrate that open source–style thinking is expanding well beyond the sphere of software production. Although their specific goals differed, each project involved a dispersed community of volunteers making variously sized contributions to development in a fairly decentralized fashion. Both PeopleFinder and the SEA–EAT Blog expanded from an existing social network, and relied on other organizations with more resources to sustain themselves. The Salesforce.com Foundation offered PeopleFinder a stronger back–end database and search engine, for example, and Google provided the SEA–EAT Blog with unlimited bandwidth on blogspot.com.

Leadership of the two blogs appears to have emerged differently. One key figure — David Geilhufe — oversaw the PeopleFinder project and negotiated relationships with other organizations. Leadership for SEA–EAT was more diffuse. Within the leaders' accounts of these two projects, there is also a marked tension between a desire to claim an important role in the effort and a wish to portray the effort as purely distributed, open, and collaborative. Each of the organizers highlights his or her role within the project, sometimes to the exclusion of other key figures. At the same time, there is a consistent message regarding the critical importance of collaboration amongst a large, distributed group. Many accounts discuss the projects as self–organized, relying on a distributed network of volunteers, while also pointing to their own integral part in its success. As discussed earlier, at one point Rohit Gupta expressed concern over moving the SEA–EAT Blog to a wiki, where individual contributions would not be clearly credited. Perhaps this view echoes similar concerns or motivations within the project's developers.

The issue of receiving credit for work carried out also applies to PeopleFinder's tense alliance with the Red Cross, when volunteers worried that the project would come to an end as a result. Yet the alliance was made despite these worries because working with a better known organization would increase the project's effectiveness, giving victims access to a central, well–known place to go for information and assistance. Instead of wading through massive amounts of scattered data online, one tsunami survivor wanted a "large easy–to–remember–even–if–I–never–imagined–I–would–be–in–a–major–disaster organization whether it is Red Cross or Google" [18]. PeopleFinder immediately recognized the need to pool scattered information about missing persons into one place, and did this successfully, but eventually found it necessary to turn these resources over to the Red Cross. In the week after the disaster, while the SEA–EAT Blog was the tenth most visited site in the humanitarian category, according to Hitwise, it never surpassed the Red

Cross whose site remained the most frequently visited [19].

Further research should explore the evolving relationship between these collaborative, open source–style projects and more well–known organizations that people might be more inclined to think of after a disaster. In true open source fashion, the collaborative efforts examined in this paper took advantage of what Yochai Benkler calls the "huge pool of underutilized intelligent human creativity and willingness to engage in intellectual effort" (Benkler, 2002). Peter Griffin echoed this rationale, arguing that "There's huge public goodwill but people don't know what exactly to do" and the SEA–EAT Blog tapped into this underutilized willingness to contribute [20]. However, disaster relief is a highly capital–intensive endeavor that requires the physical resources of existing disaster relief organizations such as FEMA, its counterparts around the world, and international organizations. These open source efforts aim to augment or improve the communication and organization of relief. The interaction between these models is therefore crucial if open source efforts are to be most effective.

As more projects like those studied in this paper emerge, future work should focus not only on gathering more data about their development and effectiveness, but also on how they build on one another. "Recovery 2.0" for example, is a phrase coined by Jeff Jarvis to describe a new effort to synthesize the experiences of PeopleFinder, the SEA–EAT Blog, and other similar projects. He opens his call for action on this issue in his blog by saying, "Let's be honest: The Web, too, was not fully prepared for the disaster of Katrina. If we"d truly learned the lessons of the tsunami and even 9/11, there was more we could have done to be ready to help" [21]. Examining the development and deployment of the increasingly well–known Sahana disaster management project, or the numerous other projects that are currently active, might show how lessons learned are diffusing transnationally in this environment. In these ways, research on open source disaster recovery efforts and their evolution sheds light on the broader subject of networked organizational structures, how they develop and grow, and how they interact with more formal, hierarchical structures. Based on the case studies presented in this paper, patterns of leadership development, organizational communication, division of labor, and inter–organization negotiation unfold in unusual ways in these agile organizations. Research is needed to clarify the relationships between these characteristics and actual effectiveness of the collaborative work.

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Calvert Jones' research focuses on the evolution of non–state actors, their networked power, and how states are adapting. She has conducted research for the Markle Foundation on American intelligence reorganization and with faculty at Stanford University's Hoover Institution on international cooperation against transnational threats. Her work experiences include NGO assignments to the Balkans and Vietnam, and she is currently a doctoral student at School of Information at the University of California, Berkeley.

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Notes

1. David Geilhufe, "Personal history of the Katrina PeopleFinder Project PART I," at http://socialsource.blogspot.com/2005/10/personal-history-of-katrina.html, accessed on 10 February 2006.

2. *Op.cit.*

3. David Geilhufe, "Katrina PeopleFinder Project Metrics," at http://socialsource.blogspot.com/2005/10/katrina-peoplefinder-project-metrics.html, accessed on 10 February 2006.

4. David Geilhufe, "Personal history of the Katrina PeopleFinder Project

PART I," at http://socialsource.blogspot.com/2005/10/personal-history-of-katrina.html, accessed on 10 February 2006.

5. *Op.cit.*

6. "Web users lend virtual hand to tsunami victims," *Indo–Asian News Service* (31 December 2004), at http://in.news.yahoo.com/041231/43/2irj5.html, accessed 24 April 2006.

7. *Op.cit.*; Paula di Maio, "Tsunami help blog, developers notes: Experiences and lessons learned," (February 2005), at http://www.content-wire.com/Custom/Documents/DocumentItem/TSUNAMIHELP%20NOTES.pdf?CFID=194652&CFTOKEN=84579784, accessed on 10 February 2006.

8. Gupta in Mitch Wagner, 2004. "SEA–EAT blog mobilizes fast for tsunami relief," *Information Week* (29 December), at http://www.informationweek.com/story/showArticle.jhtml?articleID=56800184, accessed 24 April 2006.

9. Mehta in Clark Boyd, 2004. "Web logs aid disaster recovery," *BBC News* (30 December), at http://news.bbc.co.uk/1/hi/technology/4135687.stm, accessed 24 April 2006.

10. Mehta in Mitch Wagner, 2004. "SEA–EAT blog mobilizes fast for tsunami relief," *Information Week* (29 December), at http://www.informationweek.com/story/showArticle.jhtml?articleID=56800184, accessed 24 April 2006.

11. Gupta in Mitch Wagner, 2004. "SEA–EAT blog mobilizes fast for tsunami relief," *Information Week* (29 December), at http://www.informationweek.com/story/showArticle.jhtml?articleID=56800184, accessed 24 April 2006.

12. "Web users lend virtual hand to tsunami victims," *Indo–Asian News Service* (31 December 2004), at http://in.news.yahoo.com/041231/43/2irj5.html, accessed 24 April 2006; Mitch Wagner, 2004. "SEA–EAT blog mobilizes fast for tsunami relief," *Information Week* (29 December), at http://www.informationweek.com/story/showArticle.jhtml?articleID=56800184, accessed 24 April 2006.

13. E–mail correspondence with Bala Pitchandi (23 November 2005).

14. E–mail correspondence with Rohit Gupta (21 November 2005).

15. Patrick Barkham, 2004b. "The tsunami bloggers have their day," *The Hindu* (30 December), at http://www.thehindu.com/2004/12/30/stories/2004123001672200.htm, accessed 24 April 2006; Patrick Barkham, 2004a. "Frantic search switches to cyberspace as old methods fail," *The Guardian* (29 December), at http://www.guardian.co.uk/tsunami/story/0,15671,1380495,00.html, accessed 24 April 2006; James Robertson, 2004. "Internet helps search for victims," *New Zealand Herald* (28 January), at http://www.nzherald.co.nz/section/story.cfm?c_id=5&objectid=10008353, accessed 24 April 2006.

16. Many of the organizers continued their efforts at online mobilization for disaster relief in the wake of Hurricane Katrina, apparently including Paola di Maio. The Katrinahelp wiki and PeopleFinder Project link to a Contributors Page that includes a section on di Maio, in which she makes this statement about her role with the SEA–EAT Blog. See http://katrinahelp.info/wiki/index.php/Paola_Di_Maio (Because this is a wiki, however, the statement may not be her own).

17. E–mail correspondence during November 2005.

18. Evelyn Rodriguez, a tsunami survivor, is quoted in Staci Kramer's blog at http://sdk.typepad.com/trust/hurricane_katrina/.

19. "Tsunami Blog Among Ten Most Popular Humanitarian Sites," *Hitwise: Real Time Competitive Intelligence* (5 January 2005), at http://www.hitwise.com/press-center/hitwiseHS2004/tsunami_010105.html, accessed on 18 November 2005.

20. Griffin in Devyani Onial, 2005. "He launched relief blog, it records a million hits," *Dehli Newsline* (4 January), and at http://cities.expressindia.com/fullstory.php?newsid=112836, accessed 28 April 2006.

21. Jeff Jarvis, "Recovery 2.0: A call to convene" [weblog entry],

BuzzMachine, at http://www.buzzmachine.com/index.php/2005/09/05/recovery-20-a-call-to-convene/, accessed on 10 February 2006.

References

Patrick Barkham, 2004a. "Frantic search switches to cyberspace as old methods fail," *The Guardian* (29 December), at http://www.guardian.co.uk/tsunami/story/0,15671,1380495,00.html, accessed 24 April 2006

Patrick Barkham, 2004b. "The tsunami bloggers have their day," *The Hindu* (30 December), at http://www.thehindu.com/2004/12/30/stories/2004123001672200.htm, accessed 24 April 2006.

Yochai Benkler, 2002. "Coase's Penguin, or, Linux and The Nature of the Firm," 112 *Yale Law Journal*, and at www.benkler.org/CoasesPenguin.html, accessed 24 April 2006.

Clark Boyd, 2004. "Web logs aid disaster recovery," *BBC News* (30 December), at http://news.bbc.co.uk/1/hi/technology/4135687.stm, accessed 24 April 2006.

Anjali Doshi and Kaveree Bamzai with Nirmala Ravindran, 2005. "The Blogo Crats," *India Today* (25 April).

David Geilhufe, "Katrina PeopleFinder Project Metrics," at http://socialsource.blogspot.com/2005/10/katrina-peoplefinder-project-metrics.html, accessed on 10 February 2006.

David Geilhufe, "Personal history of the Katrina PeopleFinder Project PART I," at http://socialsource.blogspot.com/2005/10/personal-history-of-katrina.html, accessed on 10 February 2006.

Peter Griffin, 2005. "The Blogger (India)," *Guardian* (27 January), at http://www.guardian.co.uk/tsunami/story/0,,1399549,00.html,accessed 24 April 2006.

Hitwise, 2005. "Tsunami Blog Among Ten Most Popular Humanitarian Sites," *Hitwise: Real Time Competitive Intelligence* (5 January), at http://www.hitwise.com/press-center/hitwiseHS2004/tsunami_010105.html, accessed on 18 November 2005.

Indo–Asian News Service, 2004. "Web users lend virtual hand to tsunami victims," *Indo–Asian News Service* (31 December), at http://in.news.yahoo.com/041231/43/2irj5.html, accessed 24 April 2006.

Jeff Jarvis, "Recovery 2.0: A call to convene" [weblog entry], *BuzzMachine*, at http://www.buzzmachine.com/index.php/2005/09/05/recovery-20-a-call-to-convene/, accessed on 10 February 2006.

Steve Berlin Johnson, 2005. "I'm Looking for Uncle John," *Discover*, volume 26, number 12, (December), at http://www.discover.com/issues/dec-05/departments/emerging-technology/, accessed 10 February 2006.

KatrinaHelp, at http://katrinahelp.info, accessed on 10 February 2006.

Jon Lebkowsky, 2005. "Katrina PeopleFinder Project Status." [weblog entry]. *SmartMobs*, at http://www.smartmobs.com/archive/2005/09/09/katrina_peoplef.html, accessed on 10 February 2006.

Paula di Maio, "Tsunami help blog, developers notes: Experiences and lessons learned," (February 2005), at http://www.content-wire.com/Custom/Documents/DocumentItem/TSUNAMIHELP%20NOTES.pdf?CFID=194652&CFTOKEN=84579784, accessed on 10 February 2006.

Dina Mehta, 2005. "Social Tools — Ripples to Waves of the Future," *Global Knowledge Review* (29 May), at http://radio.weblogs.com/0121664/categories/blogsBlogging/2005/05/29.html, accessed on 15 November 2005.

Matt Moore, 2004. "Simple question resonates online after the tsunami," *USA Today* (30 December), at http://www.usatoday.com/tech/news/2004-12-30-wr-r-u_x.htm,accessed

24 April 2006.

Devyani Onial, 2005. "He launched relief blog, it records a million hits," *Dehli Newsline* (4 January), and at http://cities.expressindia.com/fullstory.php?newsid=112836, accessed 28 April 2006.

James Robertson, 2004. "Internet helps search for victims," *New Zealand Herald* (28 January), at http://www.nzherald.co.nz/section/story.cfm?c_id=5&objectid=10008353, accessed 24 April 2006.

Doug Tsuruoka, 2005. "Web Logs Are Bringing Relief In Wake Of Tidal Wave Disaster; New Role For Medium; Blog sites offer firsthand reports of damage, links to charity organizations," *Investor's Business Daily* (6 January).

Mitch Wagner, 2004. "SEA–EAT blog mobilizes fast for tsunami relief," *Information Week* (29 December), at http://www.informationweek.com/story/showArticle.jhtml?articleID=56800184, accessed 24 April 2006.

Ethan Zuckerman, "Recovery 2.0 — thoughts on what worked and failed on PeopleFinder so far," [weblog entry.] *My Heart's in Accra*: Ethan Zuckerman's musings on Africa, international developmentand hacking the media, at http://www.ethanzuckerman.com/blog/?p=170, accessed on 10 February 2006.

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