Participatory Aid Marketplace

Designing Online Channels for Digital Humanitarians

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Submitted to the
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Abstract

Recent years have seen an increase in natural and man-made crises. Information and communication technologies are enabling citizens to contribute creative solutions and participate in crisis response in myriad new ways, but coordination of participatory aid projects remains an unsolved challenge. I present a wide-ranging case library of creative participatory aid responses and a framework to support investigation of this space. I then co-design a Marketplace platform with leading Volunteer & Technical Communities to aggregate participatory aid projects, connect skilled volunteers with relevant ways to help, and prevent fragmentation of efforts. The result is a prototype to support the growth of participatory aid, and a case library to improve understanding of the space. As the networked public takes a more active role in its recovery from crisis, this work will help guide the way forward with specific designs and general guidelines.

Thesis supervisor: Ethan Zuckerman
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1.4 Introduction

This thesis examines the many ways the public can contribute to help others in times of crises, be they man-made or natural disasters. I introduce the growing trend of participatory aid: mutual, peer-to-peer aid assisted by information and communication technologies like the World Wide Web and the smartphone. My inspirations are the many creative ways people have used the internet and related technologies to aid others in need. Remote online volunteers have used the internet to develop crowdsourced maps for decisionmakers and translate victims' requests for aid, to give two successful examples.

The spectrum of what individuals and groups can achieve online is wider and richer than our conventional imagination allows. Technology's advance over time continues to expand the realm of the possible. Knowing -- and signaling -- what can be done, where to get involved, and, crucially, how such an effort maps to others' needs are unsolved problems. A central clearinghouse of opportunities and active efforts could reduce barriers to communication and collaboration.

1.5 Motivation

The motivation for this thesis is my deep, though regularly challenged, faith in humanity: When crises[1] strike, I feel great loss for those who suffer, but the tears come

[1] I define **crisis** with Quarantelli and Hultaker's discussion of the term 'mass emergency', cited by Sarah Vieweg:[1]

as I read about the great lengths gone to (and small gestures expressed by) our fellow man. When crises strike, be they natural or man-made, we rally. The same species that is capable of turning on itself in such violence redeems itself soon afterwards, as far larger numbers of people run into danger, offer up all that they have, and otherwise express solidarity however they can with the victims.

What I've noticed, over the years, is that peoples' offers of help, while creative and inspiring, don't map well to our society's formal aid systems. The biggest disconnect I see is the insufficient answer we have to the straightforward question we all ask in the wake of terrible events: How can we help? For too long, the answer has been to send money. But given the amount of suffering we witness, and given the full range of possibilities of which we are capable as human beings, this financial exchange can feel like quite a hollow expression of our empathy.

I've been inspired, in recent years, as the technologically-driven shift from passive audience to active public has begun to provide better answers to the question, "How can I do more to help?" Technology has made the news media and an entire, ever-growing spectrum of internet-mediated actions more participatory. This opens up possibilities not only for improving the structure of crisis response within our formal aid systems, but also to grow the space of tech-mediated mutual aid, or participatory aid.

"[O]ften created by natural disaster agents, technological accidents, violent intergroup conflicts, shortages of vital resources, acute and chronic environmental threats, and other kinds of major hazards to life, health, property, well being, and everyday routines."[1]
(Note that this definition includes natural as well as man-made disasters. Many, but not all, of the examples of participatory aid in the case library and qualitative descriptions that follow can be applied to man-made conflicts, but the nature of such conflict can easily complicate these efforts for critical actors. Standby Task Force, for example, has a policy against formally deploying in violent conflicts, while other V&TC groups informally avoid collaborating with the US military.)

Charitable donations, while important, are a very small fraction of the spectrum of ways people can contribute, and a particularly poor metric for measuring the empathy of those who are caring, but not wealthy. Donations remain an important and heavily relied-upon public reaction to crisis. But the internet has opened up a wider range of possibilities for us, the public, to help formal aid actors do their work, and to help the affected people directly in new ways.

This thesis argues that the range of ways we, the public, can help in times of crisis, even from long distances away, is expanding, and the continued advance of communication technologies will continue to expand the range of options. With these newfound possibilities come new challenges, of course, as we must coordinate a wide range of varied responses, and improve our formal aid channels to better harness this mostly untapped resource.

In my last week of writing this thesis, two brothers bombed the finish line of the Boston Marathon. Patriot's Day in Boston is a beautiful holiday, where the community comes out to cheer on runners, fast and slow, as they accomplish a great feat. It was a poor target, testing the resilience of a city with a reputation for grit, and targeting marathoners who build their resilience with each day of training.

The community responded immediately in ways big and small. 'Formal actors', as they'll be called elsewhere in this thesis, ran into the smoke and flame to disentangle victims from scaffolding. Volunteers, scheduled and ad hoc, worked to deliver over 140 victims to area hospitals. When word spread of a need for housing, over 4,000 offers materialized nearly instantly on a Google Form hosted by *The Boston Globe*. The Red Cross was deluged with offers of blood donations, and tried to shift

this outpouring of goodwill to future weeks. The FBI explicitly requested the crowd at the finish line share their photos and videos of the event, and a small team of startup founders then helped the authorities improve how they collected these photos to better retain valuable metadata.[2] Around the country and world, newspapers ran the story and millions checked in with loved ones and friends, and as those who once studied at one of the Boston area's many universities felt pain for their onetime home. A solidarity run organized via Facebook event offered the runner community all over the planet a forum to check in and express their support for those in the locally affected community (and to intertwine the story with their own).

One of the most redeeming qualities of humanity is that people are 'affected' even when they have suffered no direct effects. Extended media coverage of a natural disaster increases the number of contributions for those in need.[3] Empathy translates to giving,[4] and terrible news can launch us into action. Facilitating the physical manifestation of this emotion is the motivation that drives my work.

1.6 Contributions

This work makes two primary contributions. First, I have encapsulated my research into emerging crisis response tools, projects, and processes into a living case library of participatory aid projects. The case library encodes existing knowledge and seeks to inspire future projects based on recurring crisis needs. I also derive a

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[2] http://www.evidenceupload.org/
[3] Simon, "Television News and International Earthquake Relief."
[4] Bennett, "Factors Underlying the Inclination to Donate to Particular Types of Charity."

framework from this corpus to support investigations and discussions surrounding the increasingly relevant participatory aid sector.

My research then directly informs the design and implementation of the Participatory Aid Marketplace, a web platform to aggregate participatory aid projects by needs and crises. The website seeks to match and connect potential volunteers to meaningful ways to help, and facilitates the participation of the many people outside the formal aid sector who wish to contribute to relief efforts. At the same time, it facilitates intergroup coordination for organizational directors and formal aid actors.

1.6.1 Paper Organization

This introduction will discuss my motivations and overview of my contributions. Chapter 2 explains the spectrum of ways we, as a society, respond to crises. It dissects formal and mutual aid and introduces a new phrase, participatory aid, to describe the dramatic democratization of crisis response. Chapter 3 offers a framework for understanding participatory aid projects and a deep case library of examples. In Chapter 4, I review related work, introduce my technical intervention, the Participatory Aid Marketplace, and discuss how it seeks to support various actors in the participatory aid sector. Chapter 5 discusses next steps for the Marketplace and additional research questions to investigate in participatory aid. Finally, Chapter 6 concludes the work and summarizes the key findings and limitations of this thesis.

2 Formal, Mutual, and Participatory Aid

We usually think about the modern crisis response apparatus in two parts: formal and mutual aid. This section will describe the benefits and limits of these two sectors and then introduce a third movement, participatory aid, driven by advances in technology.

2.1 Formal Aid

Formal crisis response systems may come most immediately to the mind of the reader. In the United States, this system is comprised of public institutions like the American Red Cross, government agencies like the Federal Emergency Management Agency (FEMA), and also thousands of humanitarian non-governmental organizations (NGOs).

These groups often mediate the relationship between those in need (beneficiaries) and those who can help provide aid (contributors). For much of the last century, we have relied on such institutions to alert us to crises that emerge, to tell us how we can best help those in need, to coordinate and collect our resources, and to effectively deliver this aid.

The formal aid system excels in areas where mutual aid can fail. It is designed to scale and reach more people than most mutual aid projects. The highly-organized systems offer a straightforward (and some would argue, more efficient) channel to decisionmakers who need to allocate response resources. As a result, formal aid

actors are often better funded and staffed, and are better sustained over time than mutual aid efforts. The institutional nature of these groups may cost formal aid actors some of their agility and creativity, but the bureaucracy does allow retained knowledge and institutional wisdom to accrue. Lastly, formal aid actors are provided a mandate for action, and their role as a lightning rod for resources (and criticism) can be very useful in times of crisis.

News companies have played a similar formal mediating role with regards to information about crises. We traditionally rely on the professional media to identify, explain, and contextualize crises (especially distant events). The information we have about crises is often gathered and distributed by professional news organizations. Social media is disrupting this informational relationship just as ICT are altering formal aid actors' mediation of response.

The second system of aid is humanity's natural social system of informal mutual aid, which precedes any of the formal aid organizations. As a socially organized species, humans have long provided various forms of formal and informal aid to one another in times of crisis. Our empathy can be triggered by the suffering of others -- particularly others with whom we identify. That empathy can then drive a wide range of pro-social behavior to help others in need.

Recent advances in Information and Communication Technologies have drastically expanded who can participate in mutual aid by rendering geographic distance less relevant and by increasing the potential of remote individuals to have creative impact. A new system as emerged: Participatory aid is mutual aid mediated by information and communication technologies.

2.1.1 Limits of Formal Aid Systems

The reason the resurgence and new potential in mutual aid matters is that the formal aid system has limits, and they have been exposed in recent years. This fact is generally undisputed by those working in the formal aid system.

More people affected by more crises

In order to produce the Humanitarian Horizons: A Practitioners' Guide to the Future[5] report, authors from the Humanitarian Futures Programme and Feinstein International Center interviewed representatives from the Inter-Agency Working Group (IAW). The IAW is a working group of many of the largest humanitarian agencies: CARE, Catholic Relief Services (CRS), the International Rescue Committee (IRC), Mercy Corps, Oxfam, Save the Children, and World Vision. According to Mercy Corps, "the IWG agencies have combined budgets of more than $3 billion annually and work in more than 100 countries benefiting at least 300 million people per year."[6] Together, they established that one of the core challenges in the near future is that the formal humanitarian system "will be asked to address significantly more need with significantly fewer resources."[7]

There will simply be more people in need of humanitarian aid: "More frequent and far-reaching natural disasters, coupled with overall diminishing human resilience, will mean that a larger number of persons will be made vulnerable to humanitarian risks

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[5] Feinstein International Center, *Humanitarian Horizons: A Practitioners ' Guide to the Future*.
[6] MercyCorps, "Responding to the World's Largest Humanitarian Disasters: A Conversation About Collaboration in Crisis."
[7] Feinstein International Center, *Humanitarian Horizons: A Practitioners ' Guide to the Future*, 25.

for a longer period of time, resulting quite simply in the need for more humanitarian financing support."[8] There will be more disasters and they will be of greater intensity. As of 2007, an average of 150 natural disasters a year kill 63,000 people and affect 125 million more.[9] Long-term global trends like urbanization and climate change have translated to increased vulnerability to serious disasters.[10] Drastically more people and assets are exposed to flooding, as well as cyclones and earthquakes. It is also predicted that global spending in response to disasters will triple. Five of the ten costliest disasters on record occurred in the last 5 years, with 2011 standing as the costliest year ever.[11] And there are more people, too, as the global population continues to climb each year.

Organizational Challenges

The likelihood of increased need in the years ahead compounds another challenge: the formal aid systems are inefficiently structured. Communities in the United States face serious challenges learning to interact with federal bureaucracies like FEMA in their time of need due to byzantine processes and paperwork overload. At the federal level, numerous agencies representing the government contradict one another.

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[8] Borton, *Future of the Humanitarian System: Impacts of Internal Changes*.
[9] Eisensee and Strömberg, "News Droughts, News Floods, and U. S. Disaster Relief."
[10] World Bank, *Natural Hazards, UnNatural Disasters*, 169.
[11] Sahana Software Foundation, "Making Chaos Manageable," slide 13.

Figure 2.1: The UN Cluster System

At the international level, the United Nations developed the cluster system in 2005 an attempt to organize its humanitarian response efforts (conflict or natural disasters) in areas like health, shelter, and food. The most relevant UN agency is assigned responsibility to lead each sector.

Crises have not mapped well to such artificial silos. In an evaluation report,[12] Julia Streets, et al. found several serious problems with the cluster system. First, the cluster approach assigns an entire issue like 'health' to a single lead UN agency, but that agency does not actually mobilize their own resources to fill in critical gaps in coverage.[13]

[12] Julia Streets, et al. "Cluster Approach Evaluation 2 Synthesis Report," IASC Cluster Approach Evaluation, 2nd Phase, Global Public Policy Institute p.58-60 via Chang, Natalie
[13] Streets, et al. p 56

The system has also been strongly criticized for failing to provide accountability to the supposed beneficiaries in disaster-affected populations. It's designed to include participation from beneficiary communities as a "necessary, but not a sufficient element for strengthening accountability," but reports have found that the system often falls far short of such participation, and fails to even communicate with the local population:

> In case study countries, evaluation team found no evidence or examples of clusters actively promoting participatory or community-based approaches among their members. Moreover, most clusters failed to communicate their work effectively or use participatory approaches in their own activities…In most cases, important operational decisions of clusters were not even communicated adequately to affected populations.[14]

The report finds a variety of reasons for the failure to use participatory approaches. Implementation can strongly depend on local context, but participatory approaches are also seen as too time-consuming in emergency situations.[15] The indirect nature of formal bureaucracy can also get in the way: While clusters are usually led by assigned UN agencies, these agencies then rely on local NGO partners to actually execute the work. The result is that the cluster lead has little field presence or direct interaction with the affected population. This challenge of losing the critical local presence when working at great scale is also common in other formal aid systems. Our formal aid systems remain the best organized response to major devastation that we know. The opportunity is to adapt these institutions with important changes in informal aid.

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[14] Streets, et al. p 59
[15] Streets, et al. p 60

2.2 Mutual Aid

Fortunately, society is bound together not just by formal institutions, that organizing technology of Weberian bureaucracy, but also by the densely interwoven fabric of personal social networks. In *Mutual Aid: A Factor of Evolution,* Russian scientist Peter Kropotkin critiques capitalist and feudal systems for defining human order through competition alone despite bountiful evidence of cooperation in the face of a hostile natural environment.[16] Kropotkin does not deny that competition occurs in the face of limited resources, but argues that our natural sociable inclinations towards cooperation and mutual support are underserved by focusing exclusively on the self-interested individual.

2.2.1 Ad Hoc Aid

In recent decades, there has been significant sociological research into "helping networks" to investigate the power of informal social networks in our lives. Donald Warren's 1980 book, Helping Networks, studies how these informal aid systems sit in society: "They are not groups. They often do not know each other. They are the combinations of people we turn to."[17]

There is also a wide collection of literature studying "pro-social behavior", and the forces that drive individual and collective altruism.[18] René Bekkers and Pamala Weipking completed a thorough and useful literature review of empirical studies of

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[16] Kropotkin, *Mutual Aid: a Factor of Evolution*.
[17] Warren, *Helping Networks: How People Cope with Problems in the Urban Community*.
[18] Batson, *Handbook of Social Psychology*, p282.

philanthropy and identified eight mechanisms that drive charitable giving. One of the most referenced works discussing pro-social behavior in society is Dynes' 1970 book, Organized Behavior in Disaster.[19]

The literature on "helping networks" and studies of offline social networks have analyzed how people solicit and receive aid from a wide range of others in their lives, in times of acute crisis as well as daily life. There are "[s]ystems of help, not simply those with which bureaucracy and professionalism are associated, but also a vast set of almost invisible threads of human contact used in times of crisis and need for everyday problems."[20] In the context of mental health, neighbors rely on one another naturally for social services and resources rather than seek professional intervention.[21] Shirley Patterson's exploration of "Natural Helping" found that social contacts provide mutual aid support to their neighbors out of altruism rather than expectations of future rewards.[22]

Mutual aid is also a significant force in the context of acute crises. When there is a crisis, people want to help, and will often go to great lengths to provide meaningful aid themselves. Sarah Vieweg finds collective intelligence in the aftermath of the campus shooting at Virginia Tech in 2007.[23] In Facing the Unexpected: Disaster Preparedness and Response in the United States, Tierney, et al., analyze 25 years' worth of disaster data and strongly support the finding that "disasters engender pro-

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[19] Dynes, *Organized Behavior in Disaster*.
[20] Warren, p 1
[21] Collins, "Natural Delivery Systems: Accessible Sources of Power for Mental Health."
[22] Patterson, "Toward a Conceptualization of Natural Helping."
[23] Vieweg et al., "Collective Intelligence in Disaster : An Examination of the Phenomenon in the Aftermath of the 2007 Virginia Tech Shootings Collective Intelligence in Disaster : Examination of the Phenomenon in the Aftermath of the 2007 Virginia Tech Shooting."

social, altruistic, and adaptive responses rather than negative reactions like panic."[24] Vieweg, et al. write, "Disaster situations, throughout history, have demonstrated that people rise to difficult challenges to help others, often through remarkable innovations and adaptations of their own abilities and resources to meet needs."[25]

Professional emergency response managers like Pascal Schuback understand that the affected population itself begins responding to a new disaster long before "first-responders" from formal aid groups can arrive.[26] The informal aid offered by citizens in these first hours can be critical to saving lives. One exemplary recent example is the unplanned evacuation of lower Manhattan on September 11, 2001. Kendra, et al. document how ships of all kinds, from tugboats to ferries to private pleasure boats materialized at the site of the most devastating terrorist attack in US history to help evacuate between 300,000 and 500,000 civilians stranded at the southern tip of the island with little direction from the Coast Guard.[27] Writing about this type of ad hoc mutual aid in emergencies, Stallings and Quarantelli argue that formal aid actors should facilitate these "emergent citizen groups", not just in crises that trigger a clear survival consensus, but also in divisive crises like riots.[28]

Mutual aid may be a natural inclination, but it is also at least partially driven by the limits of formal aid actors:

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[24] Tierney, Lindell, and Perry, *Facing the Unexpected: Disaster Preparedness and Response in the United States*.
[25] Vieweg et al., "Collective Intelligence in Disaster : An Examination of the Phenomenon in the Aftermath of the 2007 Virginia Tech Shootings Collective Intelligence in Disaster : Examination of the Phenomenon in the Aftermath of the 2007 Virginia Tech Shooting."
[26] "ICCM Pre-Summit."
[27] Kendra, Wachtendorf, and Quarantelli, "The Evacuation of Lower Manhattan by Water Transport on September 11: An Unplanned 'Success'."
[28] Stallings and Quarantelli, "Emergent Citizen Groups and Emergency Management."

> "Self-help or mutual-aid groups have developed, in part, as a reaction to various limitations of professional organizations. Such limitations included an "unwillingness of professionals to deal with certain problems, a limited reach with regard to various populations, an overly intellectual orientation, and monopolistic credentialism."[29]

One directly relevant example of mutual aid rising to meet a population's needs when the formal aid system fails is Gregory Asmolov's work launching the Russian Fires Map[30] (which has evolved to become Rynda.org). When wildfires consumed large areas of Russia in 2010, the ineptitude of the government response and paucity of state-influenced media coverage inspired citizen-driven aid efforts, coordinated through an Ushahidi map.[31] The mapping platform was repurposed to connect citizens in need and citizens seeking to help. Citizens used participatory media to hold the government accountable, but also to organize and collaborate on ways to respond to the fires to take the action that the formal state actors had failed to take.[32] Asmolov has since launched Rynda.org, an 'atlas of help', to match peer donors and beneficiaries under the romantic symbol of the rynda, the bell Russian sailors would strike when they were in need of help. (For an extensive treatment of affected communities' own abilities to respond to crisis, see Humanitarianism in the Network Age report by UNOCHA[33]).

2.2.2 Civic Groups Organize Mutual Aid

In addition to the ad hoc aid found throughout human history, mutual aid includes semi-formal groups like religious congregations, citizen clubs, and other

[29] Gartner and Risessman, "Self-Help Models and Consumer Intensive Health Practice." via Warren
[30] http://russian-fires.ru/
[31] Asmolov, "Russian Fires Crisis Map."
[32] Asmolov, "Crisis Mapping & Crowdsourcing as a Tool of Mutual Aid."
[33] Policy and Series, "HUmANITARIANISm IN THE NETwORk AgE."

community groups. These civic groups often serve critical organizing roles in alerting and structuring mutual aid within a community.

Like many dichotomies, the distinction between formal and mutual aid has always been somewhat artificial. Formal and mutual aid are in no way mutually exclusive, except that we may sometimes focus on the former at the expense of developing the latter. Formal aid sector workers do the best they can to save as many lives as possible, but they do not pretend to have every answer, or the resources to sufficiently help every person in every crisis. Mutual aid is recognized within the formal aid space as a powerful force.

A community's ability to manage crisis itself has been described as resilience. The concept has been popularized in recent years to describe "the capacity of the affected community to *self-organize*, learn from and vigorously recover from adverse situations stronger than it was before."[34] In Building Resilience: Social Capital in Post-Disaster Recovery,[35] Daniel Aldrich argues that the strength of (traditional) social networks themselves can predict a community's resilience and ability to recover in times of crisis. He pulls together data from four different large-scale natural disasters to prove that "social resources, at least as much as material ones, prove to be the foundation for resilience and recovery."[36] A community with a more densely connected social network and deeper social capital may prove more adept at providing mutual aid to one another, because it can more quickly share critical information, aid resources,

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[34] Meier, "Towards a Match.com for Economic Resilience in a Crisis-Stricken World."
[35] Aldrich, *Building Resilience: Social Capital in Post-Disaster Recovery*.
[36] Meier, "Does Social Capital Drive Disaster Resilience?".

and better stem population losses due to migration away from the affected area. To illustrate his argument, Aldrich compares the stark difference in post-Katrina recovery between different neighborhoods in New Orleans. The Vietnamese community centered around the Mary Queen of Viet Nam Church is deeply interconnected and rich in social capital, and was able to recruit back 90% of homes and businesses within a year of the hurricane, in addition to establishing a charter school, urban farm, and medical clinics.[37] The community was also able to organize itself to rally for official resources, like the restoration of electricity from the local utility. Other neighborhoods are still visibly suffering from the unemployment, poverty, and structural damages delivered by the storm years later. Aldrich argues that the great disparities in recovery between neighborhoods or cities are not the result of variation in official government recovery funding but rather the degree to which the responding community has

information, collective action, and social connections.

[37] Aldrich, "The Power of People: Social Capital and Post-Disaster Recovery."

2.3 Participatory Aid

Participatory aid is mutual, peer-to-peer aid assisted by information and communication technologies. The motivations behind informal, community-driven mutual aid have been around for as long as mankind, as they are natural social systems, part of every day life for human beings, evolved long before our modern formal aid organizations. Social media has made conversation more transparent, and in doing so, exposed these organic social links in myriad new ways.

2.3.1 Peer to Peer Aid

In the crisis management world, Kropotkin's term 'mutual aid' describes the acts of the affected populations in leading their own response and recovery. Participatory aid is the evolution of mutual aid, which can stand independently of formal aid systems, and which invites participation of people from all over the globe to have greater impact, thanks to ICT. We might even reimagine the role of the formal aid systems to support and inform participatory aid.

The mutual aid school of thought has gained new currency in recent years with the success of technology-mediated peer-production movements[38] like open source software, Wikipedia, and other digital projects where non-market forces drive individuals' contributions to the common good. Collaborative projects have exposed

[38] Benkler, *Wealth of Networks*.

the productive roles peer reputation and cooperation can play in driving meaningful participation.

Proponents of the peer-production trend, such as Stephen Johnson, argue that the continued debate over the appropriate role for the market and the state in society must also now include the third pole of networks of individuals. Mutual aid has evolved and grown stronger alongside our advances in information and communication technology. Johnson's book, Future Perfect, describes 'peer progressives' who organize in a decentralized manner and can actually surpass the efficacy of traditional hierarchical (and market-driven) approaches.[39] The descriptor 'peer' works, Johnson argues, on the civic level ("a jury of our peers") as well as the technical level (peer-to-peer networks).[40] These broad shifts in the agency of networked individuals are changing the crisis response industry just as they have disrupted the music, travel, and countless other industries before it.

Industry after industry has been disrupted by the rise of connective technical platforms like the internet, which has enabled end consumers (or citizens) to source their books, news, music, travel, and, increasingly, their response to crisis, directly. In the 20th century, record labels gained control of many of the stages involved in the production and distribution of music. Peer to peer filesharing dramatically disrupted the labels' 20th century distribution model, but also other stages, such as artist discovery, promotion, production, and the revenue models behind each process. In the travel industry, the middlemen known as travel agents have been replaced by more efficient

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[39] Johnson, *Future Perfect: The Case For Progress In A Networked Age*.
[40] Stempeck, "Has Politics Gone Peer 2 Peer? #P2PPOL."

web platforms that aggregate and filter numerous options for end consumers. Airbnb has further disrupted the travel industry by making private residences available to travelers, introducing serious competition to the hotel industry.

In each case, technology has brought producers and consumers closer together, or in some cases, blurred the lines beyond recognition. This creates a diminished role for mediator middlemen like retail stores, distributors, travel agents, and large crisis response NGOs. Cultural and business factors play an important role in timing, but one of the key independent variables in ICT disruption of consumer-facing industries is the introduction of intermediary platforms that supplant the human- or bureaucracy-organized options presented to consumers. These platforms usually accomplish this feat by simultaneously expanding the range of available options and improving customized filtering of these options to prevent overload and reduce friction (such as time or cost required for the consumer to take action).

Information and Communication Technologies like the World Wide Web and smartphones have not only connected us, but also digitized many of our professions. Information workers, from lawyers to designers to cartographers, now use digital tools extensively in their labor. This development has opened up the opportunity to donate one's time, and with it one's professional skills and abilities, to assist in recovery efforts. Our networked, digitized workplace allows professionals to make significant pro bono contributions from anywhere in the world. Properly allocated, the time of an individual with valuable skills could quickly surpass the value of the small donation they may (or may not) represent as a traditional donor. The range of potential ways to help has also greatly expanded. Online, the simple act of bringing attention to a crisis has

emerged as an important, if lightweight, contribution. Well-structured crowdsourcing allows even unskilled volunteers to contribute en masse.

Thus far, the participatory aid movement is small relative to the percentage of citizens that might give a donation during a telethon. One reason this is the case is that awareness of available ways to help is low (identified by Bekkers and Wiepking as a key factor in successful philanthropy). Another barrier to public involvement in participatory aid is the lack of a popular, central, and trans-crisis intermediary platform to connect those who seek to help with projects and organizations that can channel this energy.

We might expect fewer citizens to get involved in participatory aid projects relative to the number that take the simple act of making a donation. But we should also expect more people, in absolute terms, to contribute to participatory aid efforts, and in a wider range of ways than we've previously seen. This work seeks to encourage meaningful participation by producing a volunteer-friendly intermediary platform to increase awareness of channels accepting volunteer contributions and to reduce the friction of finding and joining such efforts.

The Humanitarian Horizons report predicts "the emergence of a "new humanitarianism" that will be part of neither the humanitarian nor development systems."[41] Just as participatory media opens the power of communication to the audience,[42] participatory aid invites the involvement of the people formerly known as

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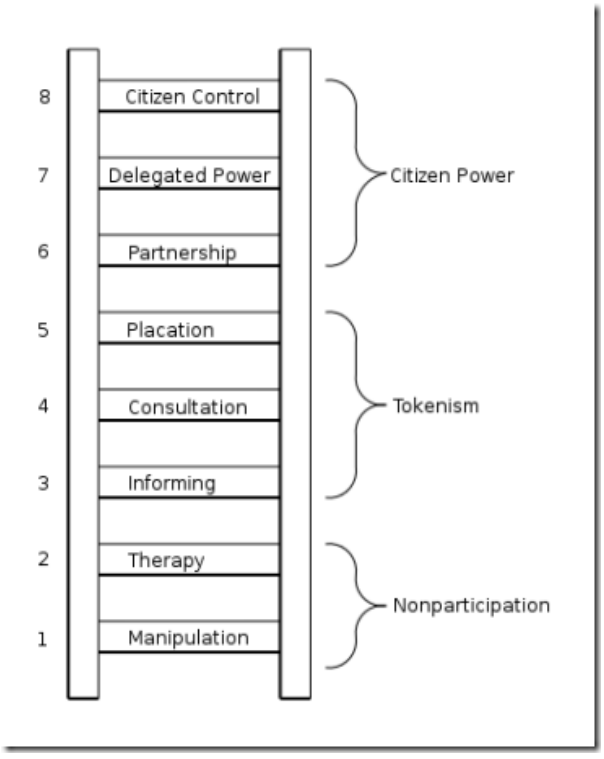
[41] Feinstein International Center, *Humanitarian Horizons: A Practitioners ' Guide to the Future*, p3.
[42] Rosen, "The People Formerly Known as the Audience."

beneficiaries, and their peers, to respond to and even drive recovery efforts themselves.

Information technology has driven participatory models of interaction forward and disrupted the companies, institutions, and societal expectations built, over decades, around the broadcast model. Macro trends independent of any specific players in the aid industry have shifted the roles and relative abilities of donors, recipients, and mediating organizations in ways we do not yet fully understand. In many ways, this shift echoes similar technology-driven disruption in other fields. Participatory aid does not outright replace formal aid, but if supported, could greatly augment it. This connection between disparate sectors requires facilitation.

Figure 2.2: Ladder of Citizen Participation



Gisli Olafsson, Emergency Response Director for NetHope, repurposed Sherry R. Arnstein's Ladder of Citizen Participation[43] to illustrate the spectrum of community-based humanitarian response.[44] Olafsson walks us up the ladder, from outright manipulation, where no participation is invited and top-down communications are used to placate the public, to symbolic placation of

[43] Arnstein, "A Ladder of Citizen Participation."
[44] Olafsson, "Community Based Humanitarian Response."

community leaders, to partnership, delegated power, and complete citizen control. Citizen control, which Arnstein aspired to in urban planning, is less ideal in a disaster context, where it can mean leaving a community to respond to crisis on its own.

Governments and other large institutions are useful because societies need ways to coordinate large groups of actors and support work that is too expensive for individuals or markets to provide. Technology now makes rapid group formation very easy (see Clay Shirky's writings, specifically Here Comes Everybody[45]) and allows individuals to organize their contributions in new ways.[46] An integrated aid system could leverage market and government structures but also modern systems of mass collaboration.

2.3.2 Broadcast Media Renders its Audiences Passive

Still things could be much worse

Natural disasters on the evening news

-Cold War Kids, We Used to Vacation[47]

The rise of broadcast media in the 20th century allowed news of crises to travel faster and to larger audiences, and eventually opened channels for a remote response. Given that awareness of need is a fundamental factor for private giving to occur,[48] it could be argued that the advent of broadcast media, as part of the broader trend of globalism, redefined our relationship with crises that occur far away.

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[45] Shirky, *Here Comes Everybody: The Power of Organizing Without Organizations*.
[46] Benkler, "Coase's Penguin, or, Linux and The Nature of the Firm."
[47] COLE et al., "We Used to Vacation."
[48] Bekkers and Wiepking, "A Literature Review of Empirical Studies of Philanthropy: Eight Mechanisms That Drive Charitable Giving."

Broadcast media, using a one-to-many model, structured appeals for aid into pre-determined channels. For example, the predominant channel of participation encouraged by broadcast media, after increased awareness, is to ask its audience for help in the form of financial donations. In 1921, a major famine hit Russian peasants. The American Relief Association sent out mass mailing appeals to the American public to collect food remittances on their behalf. Eighty years ago, radio was used by President Franklin Deleanor Roosevelt to update Americans on the status of their soldiers overseas and to encourage the audience to purchase war bonds.[49]

Widespread adoption of television brought about the advent of the telethon. This incarnation of broadcast aid solicitation is perhaps best epitomized by 1984's *Do They Know It's Christmas*? This "superband" effort was organized by Bob Geldolf to bring together numerous record industry stars and reflect some of their spotlight to tug on viewers' heartstrings, create awareness, and accumulate donations for famine in Ethiopia. The record was wildly successful and sold millions of copies, but these efforts have come under increasing criticism for conveying a simplistic message with great emotional power, only to ask the audience to engage in relatively lightweight involvement around a major crisis (give money). (This line of critique is similar to the response to Invisible Children's KONY2012 web video). Star-studded telethons remain effective if not empowering, as seen recently with fundraising campaigns behind *America: A Tribute to Heroes*, in response to 9/11, and the *12-12-12 Sandy Benefit*

[49] Roosevelt, "Fireside Chat 30: Opening Fifth War Loan Drive (June 12, 1944)."

Concert, which reached an estimated two billion people and raised tens of millions of dollars.

Broadcast media, by technical definition as well as industry norm, allows for little interaction on the part of the audience. Media critic Jay Rosen has written extensively on the expectation of broadcast audiences to remain passive: they usually consume the media in a private location, either with their newspapers at the breakfast tables or in their living rooms watching TV, and they're the final stop in a vertical supply chain of content. The audience's role is to receive images, information, and talk. They are unable to transmit, and they're atomized and disconnected from everyone else.[50] When the content transmitted are graphic images of great human suffering, audiences can experience remote post-traumatic stress disorder and general fatigue related to seeing updates about the crisis. Fortunately, the democratization of ICT has brought with it radically different expectations on the part of "the audience."

[50] Stempeck, "Jay Rosen's Three-Layer Journalism Cake."

2.3.3 People Want to Do More to Help

The dramatic increase in interpersonal connectivity has rendered mutual aid newly relevant. The precipitous drop in the amount of time it takes news to travel combined with the expanded powers of the connected individual has led some portion of the online public to reconsider what they might be able to do to help in the wake of crisis. Technology allows us to do more as individuals, but also connects us with one another to accomplish yet more, together. Popular online communications tools like Twitter support mass collaboration, even if formal aid institutions are not designed to interface with these efforts. There are more actions that a greater number of us can take in response to a crisis, even remotely, than ever before.

2.3.4 Convergence Produces Solutions

Kate Starbird has written that people now use ICT to converge digitally in the aftermath of a disaster, the way a neighborhood might converge in physical space.[51] She finds that "sociologists of disaster have repeatedly shown that the first responders to disasters are rarely the formal organizations charged to respond, but are instead spontaneous volunteers who converge on the scene and begin to help." We see this behavior emerge organically on the web as millions of users flock to Twitter and social news sites like Reddit to not only read new information, but to contribute, if possible, to the collective intelligence.

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[51] Starbird, "What 'Crowdsourcing' Obscures: Exposing the Dynamics of Connected Crowd Work During Disaster."

The transparency of conversation and free flow of information enable orders of magnitude more people to contribute to (or detract) from aid efforts. In the recent Boston Marathon bombing, 250,000 people listened to an audio livestream of the local police scanner as authorities tracked down and apprehended the second Marathon bombing suspect. Many of these people transcribed what they heard on Twitter.

The public's ability to participate in crisis response is not always within the realm of control of formal aid groups or even informal communities. Some people took to Reddit in the days following the Boston Marathon bombings to crowdsource the investigation of who perpetrated the bombing, even as officials raced around the clock to do the same. Without invitation from formal aid groups, and in violation of the Subreddit's own administrative rules, people accused a rotating cast of innocent bystanders, and later, a missing college student. The desire to help and ability to spread a message online have not proven to create universally positive results.

The trend of participatory aid is already well underway, but there are actions we can take to encourage and foster its productive growth. A few simple principles help support emergent solutions from the public. The first is to let people connect with each other. Rather than duplicate the formal hierarchies of many business-to-consumer models, allowing and encouraging horizontal connection between various volunteers can help a network become more dense, and more fruitful. A principle that is simple, technically, but a significant shift culturally is to clearly signal the macro needs identified in a crisis so that others who might be able to implement unexpected solutions can play a role (with obvious caveats for sensitive information). As Ethan Zuckerman notes in his introduction of a framework for civic engagement, if we want

'thick' civic engagement, we need to create a space that provides agency.[52] People must be invited to contribute at a meaningful level, and this contribution may not be as easily recorded as a financial donation. Peacebuilding expert Helena Puigg Larrauri, citing Zuckerman's framework, notes that to encourage thick participation at scale, we often have to devolve control.[53]

This tension is at the core of understanding participatory aid. Too often, efforts to digitize existing formal aid structures are pointed to as the standard bearers of humanitarian innovation. Take the typical early warning system. As Larrauri notes, these offer very 'thin' forms of engagement: we select information to give you, you do something with it (like evacuate). To limit our understanding of technology's impact on crisis response to recent work to extend early warning systems to smartphones would be a gigantic missed opportunity.

Room for Creativity

In convergence, members of the public often innovate and identify solutions to seemingly intractable problems. The reason we must loosen control is that it can be impossible to determine *which* member of the public will make the breakthrough (or on which new technical platform this breakthrough might occur). Humans work in social groups, and success is often a story consisting of varying degrees of contribution by a range of contributors brought together by various degrees of serendipity (not merely the performance of small, uniform tasks 'crowdsourcing' has come to describe).

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[52] Zuckerman, "Beyond 'The Crisis in Civics' – Notes from My 2013 DML Talk."
[53] Davis, "Building Peace with Technology in Sudan."

Larrauri cites John Paul Lederac's emphasis on the need to provide space for creativity in peacebuilding:

> Moral imagination arises through creative human action that arises out of the everyday and yet moves beyond what exists to something new and unexpected. Because new ways of thinking may pose a threat to the status quo, it is important to provide space for the creative act to emerge. This requires a commitment to creativity and a belief that it is possible to move beyond the parameters of what is commonly accepted...Creativity opens us to avenues of inquiry and provides us with new ways to think about social change.
>
> *The Moral Imagination*[54]

There are ways to facilitate this imagination, which will be discussed. But the first step is acknowledgement of the public's desire to do more to help than they've historically been allowed, and an understanding of their ever-increasing ability to deliver on this desire. A critical corollary is that now that they can take action, the public *will* take action, with or without permission.

We must not continue the disempowering trend of recent decades where we tell people with valuable skillsets to stay home and give money. Solicitation of private donations is an appropriate response for the broadcast era, and is still favored by formal aid groups who might believe they have the solutions necessary, and need only the funds to execute. But given the limits of formal aid systems and the increasingly dangerous world we live in, where formal actors find themselves lacking the necessary resources to take on a growing number of more intense crisis, it would be ill-advised to limit the world's contributions to one mode of expression, fluid though cash may be.

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[54] Lederach, *The Moral Imagination: The Art and Soul of Building Peace*.

When engaged to help in times of crisis, people have much more value to give than the highly-structured, bureaucratically-intermediated model of aid asks of them. The shift from broadcast to participatory media has greatly enhanced the range and depth of actions the public can take to help, and a failure to adapt to this shift leaves significant value untapped.

On a more immediate level, the public may also experience donor fatigue as the number of disasters increases and they are invited to respond through their bank accounts alone. In Globalization of Disasters: Trends, Problems and Dilemmas, David Alexander finds that too many closely spaced crisis events can cause givers to experience attention deficit and donor fatigue.[55] Alexander points to the eclipse effect hurricanes Katrina and Rita had on diverting attention and donations from the major suffering delivered by Hurricane Stan that same month. Wiepking finds that increased solicitation of donations may lead to lower average contribution amounts.[56]

A Note on 'Crowdsourcing'

The emphasis on crowdsourced participatory aid solutions such as collective data entry can distract from the ability of ad hoc and semi-formal groups to contribute creative solutions to new and longstanding problems. Participatory aid should not be narrowly defined to include merely the digitization of formal aid power structures, where the professional emergency manager now has more data at her disposal, and the public remains the passive recipient of aid (or consumer of news). The true shift

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[55] Alexander, "Globalization of Disaster: Trends, Problems and Dilemmas."
[56] Wiepking, "The Philanthropic Poor: In Search of Explanations for the Relative Generosity of Lower Income Households."

and real value offered by participatory media is that the "individuals whom emergency managers previously perceived as liabilities" can become instead "critical assets."[57]

Social media facilitates this transition by allowing connections and communications between all actors. The transparent nature of the online conversation inherently supports mass collaboration because information about needs and ongoing efforts is readily available with no actor intentionally serving as a bottleneck, the way formal aid and media organizations inevitably do while mediating the flow of information between the affected population and donors. Information availability is as critical to mass collaboration as oxygen to fire.

A more direct example of 'crowd'-driven crisis response is found in Gregory Asmolov's response to the Russian wildfires of 2010. Asmolov repurposed an Ushahidi instance to connect those in need with citizens looking to help when it became clear that the Russian media were not going to cover the full degree of the disaster. Citizens took on the role of curating and distributing information with participatory media. And then, as it became clear that the official government response would prove severely lacking, the same organized citizens worked to not only hold the officials accountable, but also take the actions that formal institutions had failed to execute.[58] The participatory aid platform they've since built, Rynda.org, thus bridges the spectrum between crisis response and civic activism.

Examples like Rynda.org remind us that not all 'crowd' labor is rote labor. Kate Starbird has written on how volunteers converge on social media following a crisis to

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[57] Wardell and Su, p9
[58] Asmolov, "Crisis Mapping & Crowdsourcing as a Tool of Mutual Aid."

improvise creative solutions the way a crowd converges to problem-solve in the aftermath of a crisis in physical space.[59] "The crowd" can rapidly decide on and execute complicated issues, and not merely by providing a corpus of opinions for someone else to average, as described by the phrase "wisdom of the crowd."[60]

2.3.5 Volunteer & Technology Communities

> "[I]t is difficult to find a single definition of V&TCs to fit every group's expertise, structure and raison d'être. They can be largely understood as volunteer-based communities who apply their technical skills to support humanitarian response. Some see V&TCs as 'networks of experts' who contribute highly specialized products and services, while others characterize V&TCs by the way they structure their communities around ideals from the so-called Semantic Web: the belief in open data, open-source technologies and non-hierarchical structures."
>
> *Guidance for Collaborating with Volunteer & Technical Communities*[61]

A new breed of hybrid organization, sometimes called Volunteer & Technical Communities (V&TC), has emerged to aggregate virtual volunteers and serve as an interface to deliver the fruits of their labor to traditional aid organizations. Crowd maps of geospatially-coded information are an early and common success story in this space.

These mostly web-native groups have emerged to fill the vacuum created by the slow adoption of new technologies by formal crisis response organizations. V&TCs are driven in part by the premise that they might serve as the tech-empowered innovation

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[59] Starbird, "'Voluntweeters': Self-Organizing by Digital Volunteers in Times of Crisis."
[60] Surowiecki, *The Wisdom of Crowds: Why the Many Are Smarter Than the Few and How Collective Wisdom Shapes Business, Economies, Societies and Nations*.
[61] Capelo, Chang, and Verity, *Guidance for Collaborating with Volunteer & Technical Communities*.

departments in the meantime.[62] There is evidence to believe that formal aid actors are not as technically adept as we might wish them to be; a UNOCHA report found that some UN agencies and clusters are technically ill-prepared to develop and implement modern needs assessment tools.[63]

V&TC organizations emerged from the reactive, event-based CrisisCamp model to take on a more proactive position with core teams remaining in place between crises. The volunteers that power the work performed by V&TCs can range from overnight recruits performing crowdsourced data entry to seasoned emergency managers with mature intragroup relationships.

Examples of V&TC groups include many of the groups discussed in Chapter 5, such as Volunteer Standby Taskforce, Humanity Road, Humanitarian OpenStreetMap Team, and DataKind. In recent years, some V&TCs have adopted relatively more formal structures. A liability report produced by the Wilson Center identified several areas of legal risk for these new organizations, and recommended that V&TCs legally incorporate, require volunteers to agree to liability waivers, purchase insurance, and consult legal council.[64] V&TC groups' response to this report has varied.

2.3.6 Limits of Participatory Aid

There are downsides to disintermediation of crisis response, and not just if you're Barnes & Noble. Hurricane Sandy, for all its creative responses, exposed several

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[62] Wardell and Su, 19
[63] UN OCHA, *ASSESSMENT AND CLASSIFICATION OF EMERGENCIES (ACE) PROJECT: MAPPING OF KEY EMERGENCY NEEDS ASSESSMENT AND ANALYSIS INITATIVES*, p5.
[64] Robson, *Responding To Liability: EVALUATING AND REDUCING TORT LIABILITY FOR DIGITAL VOLUNTEERS*.

of the challenges posed by the more direct link between communities and sympathizers. There was difficulty in aggregating the many needs and recovery efforts, with more speakers on each side of the equation. Even the best digital volunteers need to understand the critical needs on the ground.

Fragmentation of Effort

Fragmentation is troubling when you're trying to measure a national TV audience, but it's much worse when you're trying to assess a community's needs after a major disaster. Coordination of relief efforts becomes an even bigger challenge when the responders are ad hoc digital volunteers, rather than highly-trained officials. The benefits of disintermediation, such as the ability for more participants to take action, are being threatened by the challenges it poses to coordination of volunteer recovery efforts.

The creative solutions offered by ad hoc responders and V&TCs can generate a larger number of response efforts than crisis responses managed solely by large formal aid groups, leading to concern about fragmentation of attention and resources (although formal aid groups have also proven capable of dividing response efforts). Thus far, the task of merging similar projects, such as nearly identical crisis maps, or shutting down extraneous efforts, has fallen upon leaders in the V&TC community to personally negotiate.[65] Sharing effective processes to reduce duplication of effort could help actors in this space, but it is as unlikely that overlap of participatory aid projects

[65] Personal interview with Willow Brugh. March 15, 2013.

will be eliminated as it is that duplicate efforts will be eliminated in the formal aid sector.

Challenges of Evaluation

Participatory aid projects may become popular through the introduction of clever solutions or merely gaining traction on social media, rather than actual efficacy. The task of evaluating participatory aid projects for positive impact on crisis response and recovery is unlikely to prove any easier than the unsolved problem of impact assessment in formal crisis response (see also Section 5.1.5's discussion of the challenges with Needs Assessment programs), and may actually be a more difficult task. Volunteers themselves could rate their experience with various response efforts online: did the project make use of their skills? Did the project appear to have impact? Was the project well managed? But such ratings would be limited to volunteer perspective, which may not be equivalent to overall efficacy. The development of 360-degree, real-time evaluations of participatory aid projects is an area ripe for future work.

2.3.7 Hurricane Sandy as Example

Many of the participatory aid examples in the case library to follow originated in the response to 2012's East Coast superstorm. I focus on this crisis for a number of reasons. The highly-connected nature of the affected populations led to a surprising number of home-grown participatory aid responses. The crisis featured significant involvement from the affected population, but also sympathy from around the globe,

making it an ideal case study of remote and local aid. The traditional dichotomies between 'donor' and 'recipient' were exposed as false, as was the increasingly blurry line between 'online' and 'offline'.

This thesis discusses the changes brought about by technologically-mediated forces, but the resurgence of mutual aid has also disrupted organizational structures of aid entities themselves. I'll discuss this issue briefly because of the strong overlap in the shifting expectations of private citizens, but Occupy Sandy is worthy of (and likely to receive) its own thesis.

The American Red Cross and the City of New York encountered great difficulties in their attempts to serve an affected population in the millions in response to Hurricane Sandy. Their relative failure working at such scale, contrasted with the success of the relatively flat, participatory model employed by Occupy Sandy, highlighted some of the limits of top-down models of aid.[66]

Blistering critiques of the formal aid response efforts often focus on the symptoms, but Patrick Meier wrote about the systemic issues on his blog, iRevolution: "[T]here is always a dramatic mismatch in demand for responder services versus supply, which is why crises are brutal audits for humanitarian organizations… But paid responders cannot be everywhere at the same time during a disaster. The response needs to be decentralized and crowdsourced."[67]

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[66] Occupy Sandy is not the first time a flat, emergent aid model proved superior to hierarchy in a crisis. See Kendra, J. M., Wachtendorf, T. and Quarantelli, E.L. (2003) The Evacuation of Lower Manhattan by Water Transport on September 11: An Unplanned Success, Joint Commission Journal on Quality and Safety, 29, 6, 316-318.

[67] Meier, "MatchApp: Next Generation Disaster Response App?".

Inspired by their experience organizing relief with Occupy Sandy, New Yorkers like Adam Greenfield have called for "the development of a permanent, regional, mutual-aid infrastructure here in New York."[68] Greenfield's experience is representative of other reports in the aftermath of the storm and months of recovery:

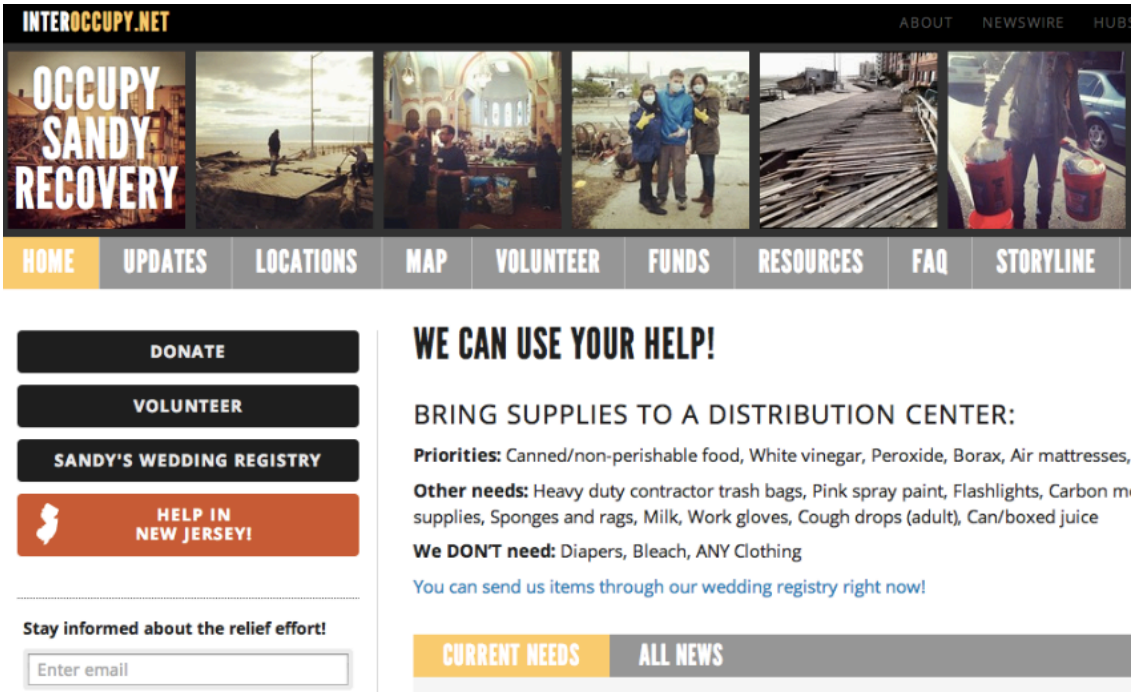
> "Even putting matters of ideology aside, Occupy Sandy was simply the easiest, fastest and most effective way for an ordinary, unaffiliated New Yorker to get involved with the relief effort. That I am aware of, it was the only organization that had meaningful and productive things for people without specialized skills to do in the days immediately following the storm, with the capacity to handle the massive volume of volunteers, donations, and contributions and the network to get those materials and energies where they could do the most good."

Greenfield touches on many of the values we attempt to enshrine in the Participatory Aid Marketplace. Volunteers joining Occupy Sandy faced low barriers to participation, relative to more formal groups, and many were able to give their specialized skills.

[68] Greenfield, "A Diagram of Occupy Sandy."

The fundamental difference between the formal aid response to Hurricane Sandy and that of Occupy Sandy group can be summarized with this screenshot, taken of Occupy Sandy's homepage during the early recovery stage:

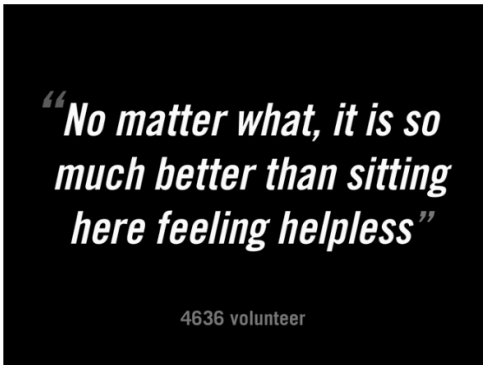
Figure 2.3: Occupy Sandy website clearly solicits volunteers' help



The group invited everyone able to help to provide aid. Their flat structure supported the scalable onboarding of unaffiliated volunteers and gave citizens looking to do more meaningful ways to contribute. Media activist Josh Stearns has described this contrast between Occupy Sandy and the Red Cross as one of networks vs. institutions.[69] Online or offline, citizens wanted to do more to help than watch a telethon weeks later, and they were disappointed when aid groups were less than responsive to their offers. (This screenshot also highlights Occupy Sandy's emphasis on good design and, in the link to the Sandy Wedding Registry, support of existing tools).

[69] Stearns, "Networks Versus Institutions: Lessons from Occupy Sandy and the Red Cross."

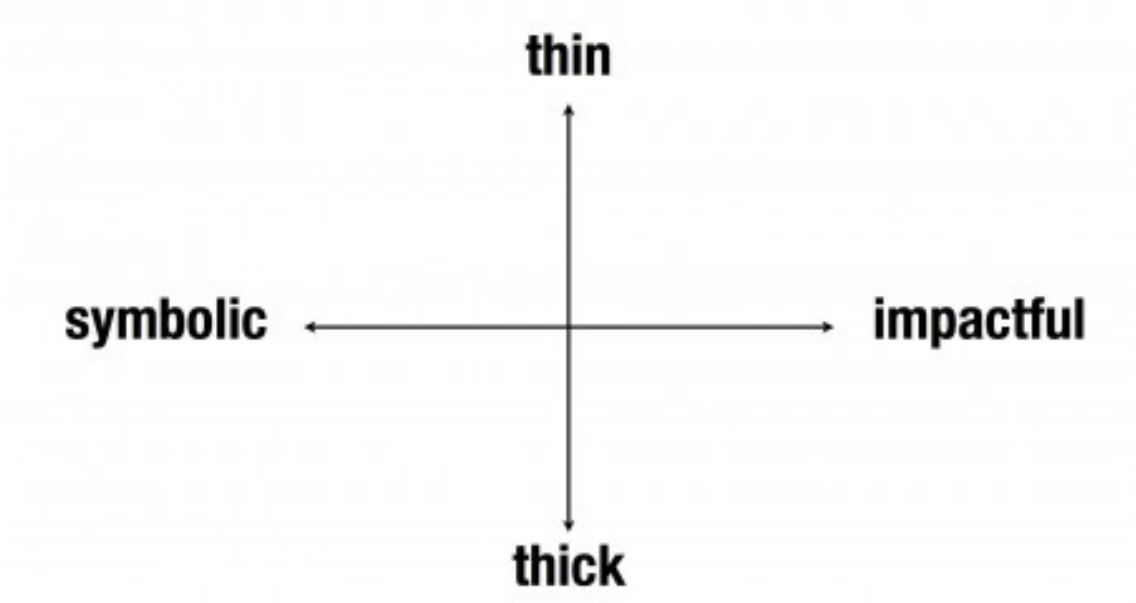
Figure 2.4: Feelings expressed by a Mission 4636 SMS curation volunteer echo the public's unmet demand for meaningful ways to help.[70]



2.4 Thick vs. Thin Civic Engagement

Ethan Zuckerman's civic engagement framework considers the range of private citizens' civic actions on a spectrum between 'thin' and 'thick' and 'symbolic' and 'impactful'.

Figure 2.5: Ethan Zuckerman's Civic Engagement Quadrants[71]



[70] Sultan, "Crisis & Interaction Design."
[71] Zuckerman, "Beyond 'The Crisis in Civics' – Notes from My 2013 DML Talk."

Zuckerman places symbolic activities like changing one's profile photo in the thin, symbolic quadrant. Voting in a democracy belongs in the thin but impactful quadrant, because the action carries great weight (in aggregate, at least), but there is much more one can do as a citizen between elections. 'Thick' engagement could include the deep, but often symbolic, actions taken by the Occupy Wall Street movement, or the deep and usually impactful actions organized by Occupy Sandy.

The internet has expanded the range of actions individuals can take in every quadrant of this graph. It has made civic actions that once required great effort (such as research) as simple as a few clicks. And it has created new debates over which actions are truly impactful and which are merely symbolic. But a key cultural shift the internet has produced is the elimination of many of the barriers requiring individuals to ask permission before taking these actions.

Occupy Sandy was primarily a field effort informed by months of organizing work within the Occupy Wall Street activist movement. But it wasn't the only way New Yorkers took aid into their own hands. The case library in the next chapter includes numerous examples found in peer-led recovery, including a variety of creative technology-mediated responses that formal aid groups would never have sought to accomplish.

3 A Participatory Aid Framework and Case Library

I collected numerous participatory aid examples over two years of research and organize them here into a case library by the primary value they deliver to crisis affected populations (or decisionmakers charged with helping these populations). From these many examples, I abstract a proposed framework to help improve common understanding of the emergence of participatory aid.

3.1 Participatory Aid Framework

We can plot the spectrum of participatory aid projects on two defining axes: who the project helps, and the degree of effort the action taken requires. The X-axis asks who the project seek to help. At one end of the spectrum, a project may seek to directly aid the affected population, as we've seen with Occupy Sandy. At the other end of this spectrum, we have projects that exist to help formal aid actors and emergency response decisionmakers (and in doing so, indirectly help the affected population). An example of this type of project might include a crisis map created by the Volunteer Standby Taskforce, a group of volunteers that can only be activated by formal aid agencies. Some of their projects seek only to provide better information and situational awareness to help formal decisionmakers make better, more informed decisions. And in the middle of this axis, we have a number of projects that seek to

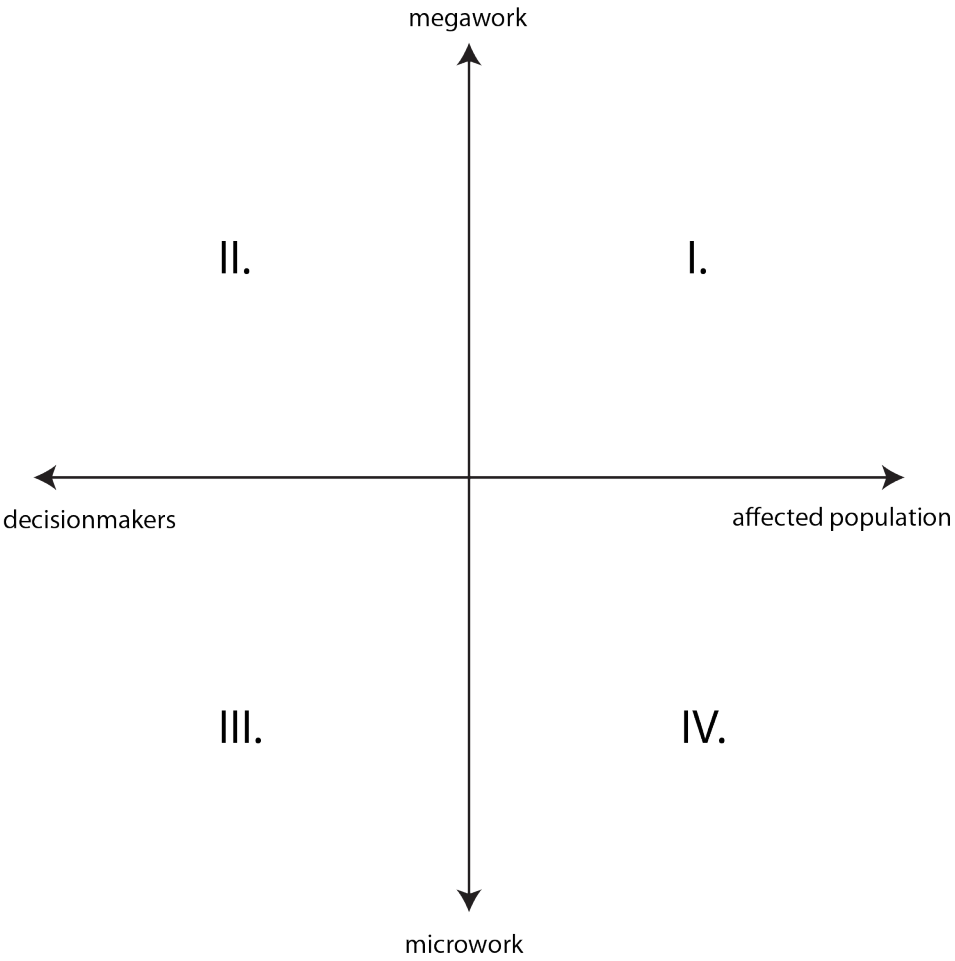
help decisionmakers and the affected population simultaneously. A publicly-available crisis map maintained by Standby Taskforce or other crisismapping groups would be placed here.

The Y-axis measures the sophistication of the skills a project demands or the degree of difficulty of the work it encourages from its volunteers. At the lower end of the axis, we plot microwork and strictly-defined crowdsourcing projects, like when the Humanitarian Open Street Map team invited the public to assess coastline damage in the many photos taken by the Civilian Air Patrol following Hurricane Sandy. Such tasks usually require little specialized skill, and are usually broken into discrete units that require very little time to accomplish individually.

On the opposite end of the spectrum, we have 'megawork,' projects that ask volunteers to give larger amounts of time and to leverage increasingly specialized skills to complete far more complicated tasks. An example a megawork project is the creation and ongoing development of Google People Finder. Building this software has required years of communications and software development, and ongoing updates as new crises occur. Projects high on the megawork axis might also include pro bono projects, best represented by Catchafire and the Taproot Foundation, where a small team of professionals donates their time implementing sophisticated professional services. The task sophistication axis is also likely to represent the relative number of volunteers involved in a project. Microwork projects are usually designed to leverage large numbers of people completing small tasks, whereas projects requiring complicated input and sophisticated labor rarely scale to include a large number of volunteers.

These two axes provide us with four quadrants with which to categorize most participatory aid projects:

Figure 3.1: Four Quadrant Participatory Aid Framework



3.1.1 Quadrant I: Helping the affected population directly with megawork

The organizers of Occupy Sandy and Friends of the Rockaways went directly to the affected population, organizing in neighborhoods like the Rockaways long before the city or formal aid groups established a meaningful presence in these areas. Their

work has been labor-intensive and has asked much of the organizers in terms of time, personal commitment, and energy.

3.1.2 Quadrant II: Helping formal decisionmakers with megawork

The GIS professional volunteers at MapAction fly in to the disaster area itself on immediate notice to provide formal crisis response decisionmakers with regularly-updated information and maps. Another example is some of the work done by the Virtual Operations Support Teams (VOST). The concept, created by emergency manager Jeff Phillips, multiplies emergency managers' force by bringing in remote professional emergency managers to take on geographically-agnostic tasks of all kinds (e.g. researching conflicting agencies' policies, getting messages out to the public).

3.1.3 Quadrant III: Helping formal decisionmakers with microwork

Many of the popular 'crowdsourcing disaster relief' projects belong in this quadrant. These include Humanitarian OpenStreetMap's assessment of images, Konbit's translation of SMSes written in Creole on behalf of aid workers on the ground, and the crowdsourced annotation of large volumes of tweets used in several projects, including Standby Taskforce's use of the CrowdCrafting microwork platform in response to Typhoon Pablo.

3.1.4 Quadrant IV: Helping the affected population directly with microwork

Projects that attempt to crowdsource the matching of affected population's needs with a broader database of offerings are representative of this quadrant. Recovers.org worked with teams of volunteers at NPower to match thousands of requests for help with many offers of aid. Projects like Need Mapper and Castaneed attempted to do this matching automatically and at scale. HopeMob regularly asks its hundreds of thousands of followers to make small donations that, when aggregated, will directly help the featured person or family or group in need.

Example Spectrum of Engagement

There is a long spectrum of ways to help between microwork and megawork:

- Read about a crisis online, and in doing so, contribute a tiny degree to editors' decision to feature such information
- Retweet, Like, and post updates about a crisis online, and in doing so, contribute a small degree to your network's awareness of the crisis
- Curate and share specific useful recovery information on social networks to help disseminate it
- Participate in crowdsourced efforts to assess images, tag content, or verify sources
- Donate an old laptop to a project in need of a basic server
- Participate in a weekend-long hackathon to produce creative solutions to established needs of decisionmakers, and stay in touch by email afterwards to help make some tweaks and updates

- Create and run a unique software project, handling incoming requests, updates, attached social issues, and eventually merging with another project to improve impact and lifespan
- Lead a consulting engagement for six weeks with a local aid group to help them improve their communications and grant-making abilities
- Regularly coordinate volunteer teams between multiple crises and even preparation exercises

3.2 Case Library of Participatory Aid

The participatory aid framework offers parameters within which to understand participatory aid projects, but we must also study the projects themselves. This case library focuses on the new ways people help others in times of crisis with information and communication technologies playing significant roles as mediators. Some of the cases repurpose existing mainstream ICT in the context of a crisis, but most feature products, projects, and processes designed specifically to respond to disaster.[72]
The library seeks to produce a comprehensive map of the potential of participatory aid. This collection directly informed the design of the Marketplace, detailed in Chapter 4. The library also aims to surface examples of related work when similar needs arise again in future crises. Lastly, I hope to expand our collective imagination with regards to how, exactly, the public can contribute via participatory aid.

[72] The library also includes some overlap with projects from related arenas, such as development, political activism, and participatory media. I include these tangential examples when they relate closely to trends in participatory aid.

3.3 Case Sections

Emergency Preparation
Pro-active inventory of resources, assessment of risk, and education

Basic Survival Needs
Health, hygiene, shelter, and other immediate recovery needs

Communications
People seek information and connection with loved ones and the outside world

Situational Awareness
A clear understanding of the critical elements of an incident: locations, needs, conditions

Professional Skill Donation
Volunteers contribute their specialized professional skills

Attention as Aid
Generate awareness and empathy for underreported crises

Software Projects
Developers build participatory aid products

Crowd Cognition and Creativity
People respond to the full spectrum of human needs and generate new recovery solutions

Donation Innovation
Traditional fundraising accelerated by digital connections

3.3.1 Emergency Preparation

Preparation for the inevitability of disaster is widely recognized to be not only important, but also the most efficient way to invest crisis response resources. Unfortunately, mainstream attention turns to crisis response most acutely after a disaster has occurred. The ratio of participatory aid projects addressing crisis response suggests that this reactive posture occurs online as it does elsewhere. There have been a variety of participatory aid efforts aimed at proactive preparation and prevention, however.

Social Inventory

The design consultants at IDEO and the city of San Francisco have developed SF72, a social app designed to "redefine preparedness". The app helps citizens collectively inventory their crisis response materials and skills within their existing social networks.[73] The goal is to connect people in need to existing resources in natural ways that leverage (but also respect) the trust inherent in social networks, adopting lessons in flexibility from the sharing economy, rather than focus

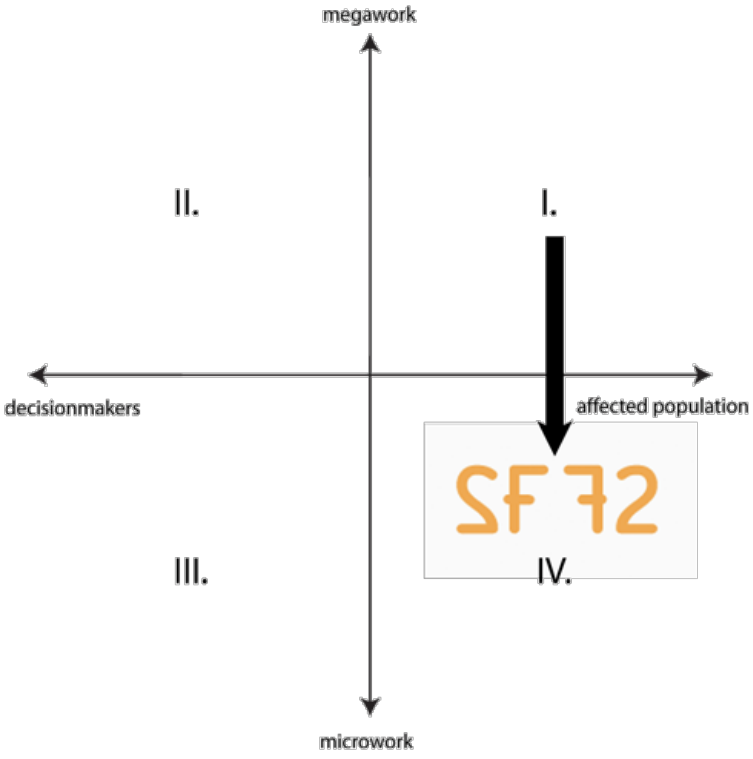
[73] Sharrock, "San Francisco Is Building A Social Network For Emergencies Only."

on convincing citizens to stockpile supplies. In this way, the effort helps citizens 'pull' in time of need rather than rely on typically underprepared 'push' resources:

> "Pull allows each of us to find and access people and resources when we need them, while attracting to us the people and resources that are relevant and valuable, even if we were not even aware before that they existed."
>
> John Hagel III and John Seely Brown[74]

This project is exceptionally clever because it engages the population directly to shift crisis preparation further down the 'microwork' end of the axis.

Figure 3.2: Placing SF72 in the Participatory Aid Framework



[74] Seely, Stanford, and Corner, "The Power of Pull."

Educational Games

A variety of apps and websites help make the educational work of disaster preparation less onerous. Quake Quiz SF[75] is an interactive quiz that helps citizens prepare for earthquakes in a variety of contexts, like driving, at the beach, and at work. SF Heroes offers points, badges, maps, and skills trainings via Android and iPhone apps.[76] Like SF72, these games are targeted directly at the (potentially) affected population and seek to make crisis education a less onerous tasks. Together, these are but two examples produced by technologically equipped emergency management offices.

Advance Research

Crisis preparation can also help formal aid decisionmakers. The Standby Taskforce, as one of the more organized Volunteer & Tech Community groups, has activated for several crisis preparation deployments. They have deployed for disaster simulations in Columbia and Samoa and mapped for preparedness in South Sudan and the Democratic Republic of Congo. In the latter project, SBTF volunteers assembled population data, baseline pre-disaster indicators, and constructed a timeline of major recent political events, conflicts, and

[75] http://quakequizsf.org/
[76] http://sfheroes.com/

disasters.[77] This information was provided to the Assessment Capacities Project, which seeks to improve humanitarian aid by improving actors' understanding of the needs of the affected population. SBTF also crowdsourced the curation of preparedness information in South Sudan.[78]

An even more ambitious SBTF project were the 21 country profiles[79] volunteers produced to develop deeper regional awareness ahead of disasters. Regional teams produced an emergency directory of disaster risk management organizations as well as a database of "pointers", country-specific knowledge that might prove useful to volunteers and staff unfamiliar with the country.[80]

Risk Assessment

Risk assessment is another area where volunteers can help formal decisionmakers before crisis occurs, especially via microwork. In February, 2013, OpenStreetMap Nepal and the Open Data for Resilience Initiative (OpenDRI) organized a 'mapathon' to improve earthquake risk assessment for Nepal's earthquake-prone capital of Kathmandu. Volunteers from Standby Taskforce and elsewhere have

[77] Farmer, "ACAPS Data Deployment."
[78] Helena, "OCHA South Sudan Deployment: Curating Data for Disaster Preparedness."
[79] SBTF, "Country-List and Workflow."
[80] SBTF, "Regional Teams and Regional Data."

traced satellite photos of homes to produce digitized maps of local infrastructure, producing a more accurate risk assessment of the city.[81] Arlene Ducao's OpenIR project improves the online accessibility of satellite infrared photography itself to allow the public to assess topographic risk in new ways, such as the risk of flooding in Jakarta, Indonesia.[82] This work is likely to benefit the affected population as well as decisionmakers working on their behalf, and is likely to require more specialized skill than microwork projects.

UNICEF, meanwhile, received money from Dell to launch the UNICEF-GIS project, which encouraged youth in Brazil and Haiti to map their communities' risk using mobiles, another lightweight task, although aimed at helping the potentially affected population and decisionmakers alike.[83]

[81] OSM Nepal, "OSM Tasking Manager."
[82] http://openir.media.mit.edu/main/
[83] "UNICEF-GIS."

3.3.2 Basic Survival Needs

The most common needs following a crisis are well-represented in the UN Cluster system: health, food, water and hygiene, and emergency shelter, among others. Our first inclination is to consider connective technology like the web a fairly limited tool for changing such concrete, on-the-ground realities. And it is, relative to the resources and supply chain logistics of formal aid groups. But there have been a few worthwhile examples, in recent years, of participatory aid projects that take on these basic challenges in new ways thanks to mass goodwill organized with information technology.

Health and Hygiene

Even that most analog of crisis response needs, that most heretical of publicly-contributed donations, physical supplies, are not immune to advancements in ICT that threaten to cut out the formal aid groups mediating the relationship. For years, the Red Cross and other large aid organizations have beseeched donors not to send physical goods or food, and for years, some number of donors have ignored this advice and shipped physical supplies anyway. Donors like to ship physical goods for a number of reasons:

- The donated supplies are mailed to the area in need, limiting chances that the aid will be repurposed for other crises, as money can be
- Studies have found that donors like to fulfill a specific, concrete need, rather than pay for administrative costs
- The feedback loop is fairly instant: once the package is delivered a few days later, the donor knows their help has been received, unlike financial donations, where large amounts of aid money can go unspent even as people suffer

And coordinating aid groups have good reasons to discourage this behavior:

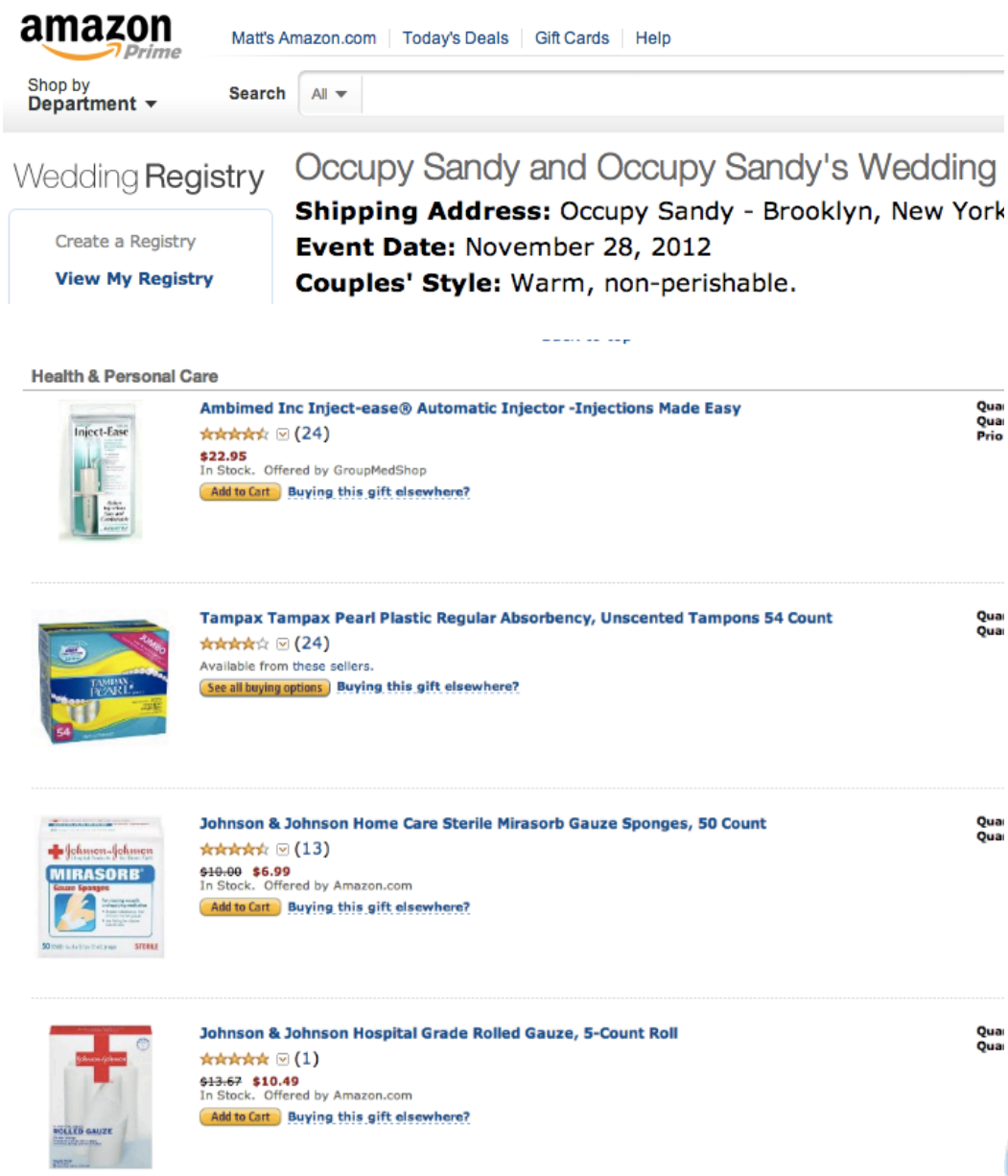
- The cost to open, inventory, and distribute these goods often exceeds their value
- There is a gap between donors' understanding of what supplies are needed and what they are likely to send; it's far more likely for t-shirts and casseroles to show up than specific equipment and medical supplies
- The gap between changing needs and arriving donations can leave the aid group stuck with entire warehouses full of unneeded items, clothing, and rotting food

The latter half of this logic has been altered, in one case, by the simple repurposing of an e-commerce giant's wedding registry feature. Three friends, like many others looking to help with recovery, found no need for their help at a local shelter. Like many others, they joined the Occupy Sandy movement. On their way to the store to purchase food to donate, the friends came up with using Amazon.com's wedding registry

wishlist feature to coordinate the donation of goods and supplies.[84] The tool was designed to allow couples to share the list of items they would like as gifts on their wedding day. As gifts are purchased, they are automatically taken off the list to prevent duplicates. This turned out to be exactly the technology (and e-commerce platform, and delivery channel) necessary to make donor-provided supplies work for recovery groups. The mechanism maintains the important elements donors seek: an instant feedback loop, a clear sense of how, specifically, you have helped. It also improves logistics for the mediating group: only the specific items needed can be purchased, and only in volumes requested ("Couples' Style: Warm, non-perishable"). Relative to nonprofit donation pages, conversion rates are likely drastically improved by lower friction throughout the donor experience: Amazon has millions of customers' payment information saved, has built and tested patented one-click payment technology, and offers free shipping to millions of Amazon Prime members. By piggybacking on one of the world's most successful e-commerce companies, Occupy Sandy has been able to make individual donations of supplies economically feasible where formal aid groups could not.

[84] Garber, "Occupy Sandy Hacks Amazon's Wedding Registry (in a Good Way)."

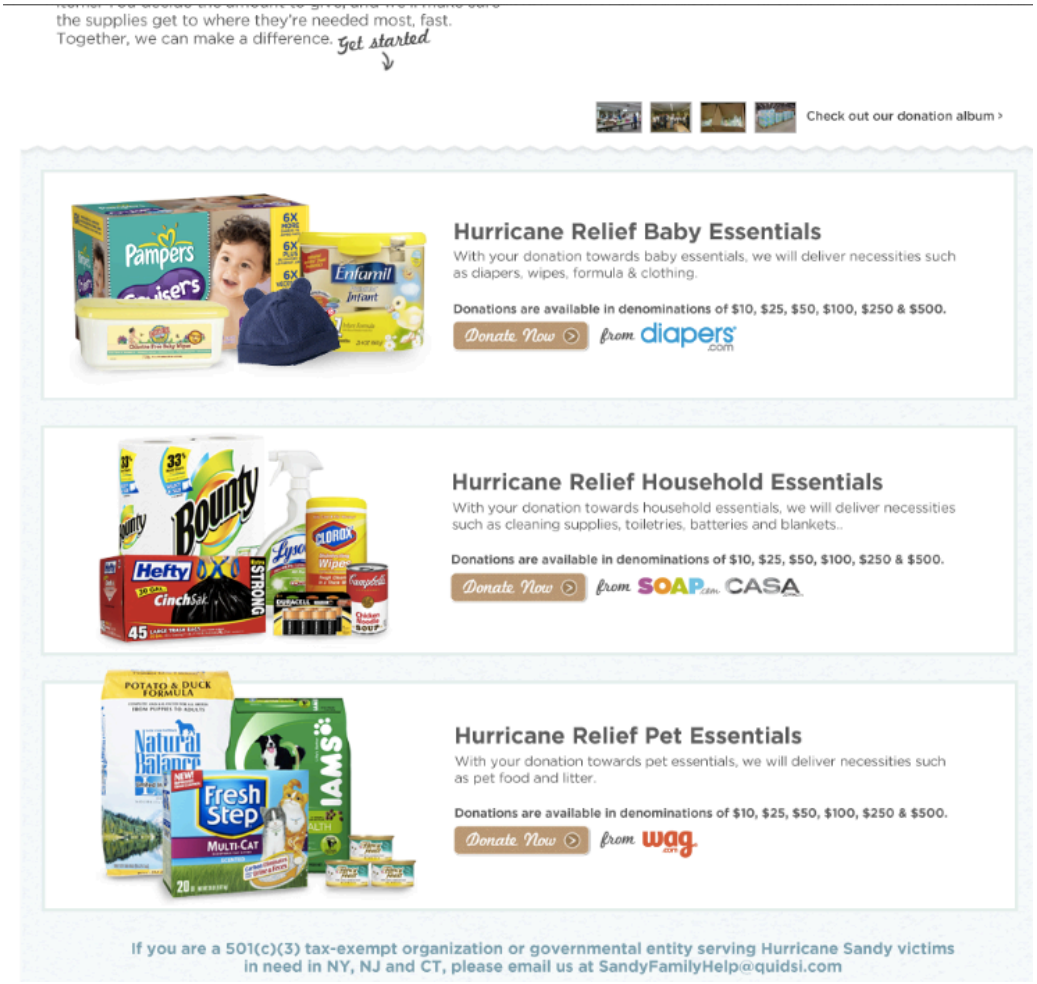
Figure 3.3: Occupy S4andy's Amazon.com Wedding Registry wishlist



A number of New York-based startups offered in-kind donations to provide additional physical goods and shelter. For example, consumer goods site Soap.com donated large volumes of toiletries, medical supplies, and diapers to local aid groups. A wide variety of

online efforts coordinated food donations from area farms and restaurants to support those in need, as well as the service industry itself.

Figure 3.4: Soap.com lets donors choose household good packages to give



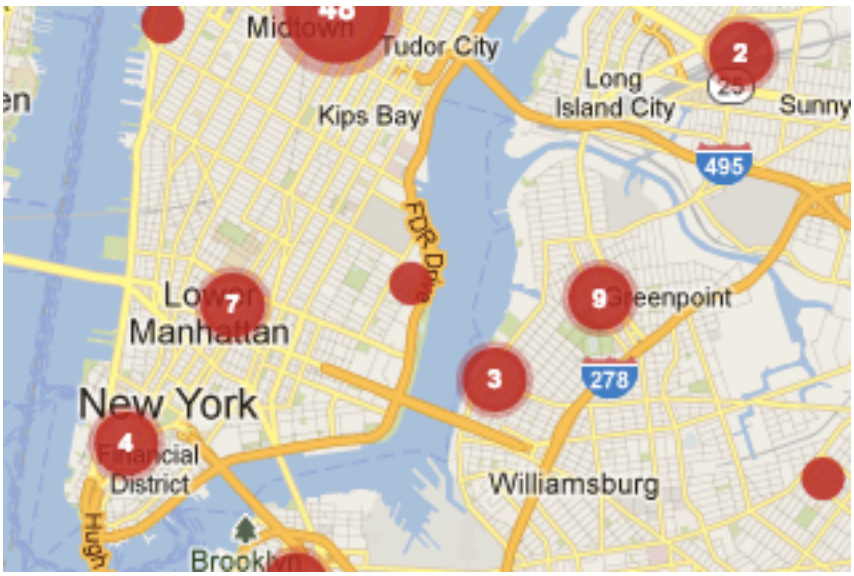
Shelter

A major need that emerged in the aftermath of the destructive superstorm was shelter. Emergency responders sought more beds, from any source. Apartment rental site airbnb, a business designed to deliver value from under-used housing, came forward as one creative solution to shelter. The company first waived its fees for displaced residents, and

soon coordinated donated room listings from other New Yorkers. This required reconfiguring airbnb's billing system to accept donated rooms, as well as coordination with FEMA to modify the federal agency's reimbursement policy to accept email receipts in lieu of formal leases. Figuring all of these complications out on the fly during the crisis was not ideal, but now the systems are in place to support similar efforts the next time flexible urban shelter accommodations arise as a major need.

Leaders of New York's technology startup community also made possible the donation of a different kind of shelter: commercial real estate. Noel Hidalgo launched the Sandy Coworking Map to coordinate donations of desk and office space and enjoy, once again, wifi, coffee, electricity, and a professional work environment. While not as critical a need as basic emergency shelter, the employees at many startups, companies, and NGOs who were unable to resume their work for weeks after the storm were able to resume their livelihoods and economic productivity sooner as a result of this project. The map became a central clearinghouse for this type of aid, and, in a partnership that could point towards a future where formal and mutual aid systems support one another, the NYC Economic Committee began verifying offices and listing additional space on the map. Digital volunteers led the charge and reacted to a community need, and the formal city agency supported and improved the effort.

Figure 3.5: NY Tech Meetup's Sandy Coworking Map lists donated office space



These projects seek to secure basic aid for the affected population directly, rather than routing money through formal aid actors. Establishing channels for this direct aid to flow can certainly approach megawork, whether it's processing hundreds of Amazon.com orders or running a successful Crowdmap. Once such supply chains are in place, though, other members of the public can contribute in relatively lightweight ways like making an Amazon purchase.

3.3.3 Communications

One of the most immediate human needs in the aftermath of a disaster is the ability to communicate. Responders and aid groups need to reach those in the area to determine needs and coordinate response, and communications networks become swamped with civilians trying to reach loved ones and confirm their well-being.

Technical Connectivity

Connectivity itself is often a need. On the ground, restoring connectivity can mean those in the affected population sharing consumer electronics charging points as well as the restoration of internet access, or encouraging companies like Verizon to bring in mobile network towers to restore data connectivity.

From the perspective of participatory aid, a substantial number of volunteer-driven groups seek to leverage their members' technology expertise to help formal aid groups and the affected population itself get up and running again. In the aftermath of Hurricane Sandy, the New York Tech Responds group established a needs request page that provides an overview of the technology services they offered those in need (see Appendix 1).

Find Missing People

That most basic of communication needs -- reuniting with loved ones -- has been addressed by a variety of digital projects. For example, Facebook emerged as a hub for this type of information within hours of the mass shooting at Virginia Tech in 2007.[85]

Because this need is so common in the wake of a disaster, the idea for a person finder tool and open database has come up many times. The joint efforts to consolidate projects and improve the application with each major disaster offers a positive example of how an open crisis technology project can benefit from the sporadic but potent waves of attention that follow crises.

The People Finder project is one of the earliest examples of participatory aid. Immediately following Hurricane Katrina, dozens of technologists enabled 4,000 volunteers to enter 90,000 records.[86] In the process, the group created the People Finder Interchange Format, itself an early successful example of open standards in the crisis response space. Google developer Ka-Ping Yee has been instrumental in creating and maintaining the XML standard.

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[85] Chew, "Pandemics in the Age of Twitter: A Content Analysis of the 2009 H1N1 Outbreak by A Content Analysis of the 2009 H1N1 Outbreak," p24.
[86] Wikipedia, "Katrina PeopleFinder Project."

Figure 3.6: The original Google Person Finder application

Following the earthquake in Haiti, there were again many duplicate efforts to help people locate one another. New York Times technology columnist David Pogue ran an email from Chris Csikszentmihalyi, then director of MIT's Center for Future Civic Media encouraging news companies to centralize their efforts with Google's embeddable person finder widget rather than continue to silo data across efforts.[87] Thousands of entries collected via a CrisisCamp hackathon project were merged with Google's Person Finder and embeddable widget, which relies on the PFIF format. The Person Finder project has been open-sourced and used following earthquakes in Chile, Yushu, and Japan.[88]

[87] Pogue, "Information on Haiti Is Getting Siloed."
[88] Google, "Google Person Finder."

A similar project is Refugees United's web and mobile reunification search tools, built by Tomas A. Krag. The software is designed to reunite some of the world's 40 million refugees, as opposed to Google Person Finder's databases of immediate crisis survivors. This database also differs from Google Person Finder in that it does not expose personally identifiable information.

Like the Basic Aid projects, these projects were both developed by professional software engineers producing megawork, but the databases that drive them are eventually populated by the crowdsourced reporting of individuals' location and status. Formal aid actors may benefit from this information, but the primary audience is to help the affected population itself find information about loved ones.

Communications with the Affected Population

We are far more connected today than we were when we designed shrieking television emergency alerts. But, as an audience, we're also fragmented across more media. Emergency managers have begun to consider how to modernize their broadcasts to continue to reach people where they are. But beyond broadcasts, there is potential as well as need to engage in two-way conversations with affected populations.

Digital Push Communications

Digitized crisis alerts don't generally fit the definition of participatory aid, given that they are essentially the evolution of the traditional, centralized formal aid communications. For example, Google.org's Public Alerts bring emergency broadcasts into the smartphone age by posting updates across Google Search, Maps, and Google Now (the intelligent notifications system for Android devices).[89] GeoLoqi (recently acquired by ESRI) and other location-based mobile technologies allow groups to push messages to anyone inside a given geographic area. This technology, while exciting, retains the traditional broadcast model where formal aid agencies push a message to a population. It does not allow for mass collaboration. As Willow Brugh points out, the public's ability to speak is often paired with the expectation of receiving a response.[90]

One area where crisis alerts do involve public actors is the work Volunteer & Technical Community groups have conducted to help bring formal aid agencies' messages (sometimes kicking and screaming) into the social era.

The challenges of this work are well covered by the Social Media Emergency Camp report.[91] While formal aid agencies drag their

[89] Google.org, "Public Alerts."
[90] Email with author, May 5, 2013.
[91] III, Wardell and Su, *2011 Social Media Emergency Management Camp Transforming the Response Enterprise*.

feet for fear of expanded responsibilities or unknown liabilities, V&TC groups like Humanity Road have helped fill the vacuum online during this transitional period.

Humanity Road's mission is to educate the public to "survive, sustain, and reunite." An example of this mission in action might include transcribing official emergency radio and TV broadcasts to social media: if you've lost power or left your home, it's unlikely you have an emergency radio or portable TV, but quite likely, in the immediate aftermath, that you have your smartphone and access to social media.[92] This assertion has been backed up by data in at least one crisis: Twitter usage more than doubled in the two days following Hurricane Sandy compared to the two days prior to the storm.[93] Humanity Road focuses on disaster preparedness and education, disaster response, and process improvement.[94]

Usage of Existing Media Channels

Another way formal aid groups can reach affected populations with push messaging is to utilize existing media channels. The Information As Aid project produced country-by-country guides to professional media outlets that might be enlisted to disseminate

[92] Interview with author, “Cat Graham.”
[93] Pew Research Center, *Hurricane Sandy and Twitter*.
[94] Starbird and Palen, “Working and Sustaining the Virtual ‘Disaster Desk’.”

important messages.[95] The project also compiled a messaging library to provide crisis responders with effective terminology with which to communicate over broadcast media (for example, how to communicate the availability of antibiotic medicine in areas with related disease). The range of actors that can make use of this online resource sits somewhere between the affected population on the receiving end of a broadcast message and the international aid professionals who funded, developed, and host the library.

Of course, if we use social media solely as the digital version of push communications, we will miss enormous potential, and fall far short of contemporary expectations of the general public: Even in 2010, the Red Cross survey found that 16 percent of respondents had used social media to get information about an emergency, and 72 percent stated they would mention emergencies on social media.[96] Two-way communications with the affected population save lives and can help determine needs.

Here, too, communications technologies are forcing a shift in how we think about the role of disaster-affected communities. The very beneficiaries aid groups work to serve have often been "left in the dark" regarding the developing situation and even their own fate, despite

[95] InfoAsAid, "Media and Telecoms Landscape Guides."
[96] Wardell and Su, p9

being provided basic supplies like food and water. A BBC World Service Trust report found that insufficient consideration to the information needs of beneficiaries had rendered aid efforts less effective, and, in some cases, outright undermined the work.[97]

At the core of this debate is the reality that information is power, and when affected populations are insufficiently informed, they are left powerless in the hands of aid groups, governments, and others seeking (but sometimes failing) to help. The Communicating with Disaster Affected Communities Network (CDAC) convened formal crisis responders to respond to this unfortunate situation, but the project has since concluded.[98] Fortunately, social media can still be leveraged to better inform not only formal aid actors, but also the affected population itself.

From an information perspective, affected populations stand to gain new awareness, to the extent that they are connected via communications technologies. Traditionally, professional gatekeepers have mediated crisis information. Information shared via social media is much more likely to be publicly available and transparent to all observers.

[97] BBC World Service Trust, *Left in the Dark: The Unmet Need for Information in Humanitarian Responses*.
[98] "Communicating with Disaster Affected Communities Network."

Public Laboratory founder Jeff Warren contrasts formal aid actors' role as information gatekeepers with the participatory conversation taking place on social media: "It's like Reddit. When the entire conversation's taking place in a thread, it doesn't matter that I came in late. I can quickly catch up with who said what, how the conversation evolved, and then make my own judgments. There's no information bottleneck – it's all right there in front of me."[99] Transparent crisis response dialogue allows more natural involvement of the affected population than even the most open aid organization can offer with their push communications. Such communications are designed to benefit the public and formal aid actors alike, and the degree of individual involvement can vary widely from a few quick updates to the curation of huge volumes of information over long periods of time.

[99] Conversation with author, September 12, 2012

3.3.4 Situational Awareness

The US Congressional Research Service defines situational awareness as “the ability to identify, process, and comprehend critical elements of an incident or situation” which can “help officials determine where people are located, assess victim needs, and alert citizens and first responders to changing conditions and new threats.”[100]

Situational awareness begins with *crisis discovery* itself, and here, too, our collective use of ICT offers new potential. The emerging field of 'infoveillance' monitors the large amounts of data we create in our daily, connected lives to improve awareness, identify new events, and measure trends. The most famous example of infoveillance in a public health context is Google.org’s Flu Trends, which measures the volume of illness-related search queries across Google’s global footprint to identify and predict patterns in health. The data is available for researchers and comparison across regions.[101]

[100] Lindsay, *Social Media and Disasters: Current Uses, Future Options, and Policy Considerations*.
[101] Google.org, “Flu Trends.”

Another form of infoveillance is our ability to monitor and "listen" to social media platforms. For example, the relatively accessible nature of data on Twitter has led researchers to monitor the spread of flu[102] and bird flu[103] with publicly available information collected from the platform. There have also been studies to detect earthquakes based on Twitter's social signals.[104] The United States Geological Survey created a platform, Did You Feel It, to collect distributed citizen reports of tremors, and has also distributed software to measure laptop-based accelerometers en masse.[105]

A relatively lightweight way to consider the value of participatory media with regards to managing a crisis is to help emergency managers "listen" to social media messages posted by the affected population to more accurately determine needs and improve situational awareness. There is certainly still great need to train formal aid agencies to use social media listening platforms like Radian6 to glean actionable information from a busy stream of data. This is an interesting development in tech-mediated crisis response, but a weak form of participatory aid, because all it asks of potential collaborators is that they post updates as would anyway. As the Red Cross survey found, 72% of respondents

[102] Lampos and Cristianini, "Tracking the Flu Pandemic by Monitoring the Social Web."
[103] Chew, "Pandemics in the Age of Twitter: A Content Analysis of the 2009 H1N1 Outbreak by A Content Analysis of the 2009 H1N1 Outbreak."
[104] Sakaki, "Earthquake Shakes Twitter Users : Real-time Event Detection by Social Sensors."
[105] Palen et al., "A Vision for Technology-Mediated Support for Public Participation & Assistance in Mass Emergencies & Disasters."

planned to mention crises on social media.[106]

Given the volume of data, the ability to semi-automatically extract a population's needs from organic conversation is alluring, and has attracted considerable research. One early system attempted to train people to adopt a crisis-specific syntax in their tweets to facilitate the aggregation of that information,[107] although it will be a long road to convince the public to adopt this encoding at meaningful scale. Further work has approached these large volumes of data by bucketing crisis tweets into more easily understood sub-topics,[108] geographically-identifying information,[109] and analyzing information curation performed by the crowd itself.[110]

More ambitious projects underway seek to apply machine learning and Natural Language Processing to large corpora of social media posts to extract key findings with little human intervention. One of the most advanced projects in this space is the Qatar Computing Research Initiative's Artificial Intelligence for Disaster Response (AIDR). Conceived as an open source Twitter dashboard for disaster response, the tool moves beyond the manual classification found in earlier

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[106] American Red Cross, *Executive Summary: Social Media and Disasters Survey 2011*.
[107] Starbird and Stamberger, "Tweak the Tweet: Leveraging Microblogging Proliferation with a Prescriptive Syntax to Support Citizen Reporting."
[108] Platt, Hood, and Citrin, "Organization of Social Network Messages to Improve Understanding of an Evolving Crisis."
[109] Vieweg et al., "Microblogging During Two Natural Hazards Events: What Twitter May Contribute to Situational Awareness."
[110] Starbird, "Digital Volunteerism: Examining Connected Crowd Work During Mass Disruption Events."

research to combine automatic tagging of tweets and microwork to delegate the work that still needs to be completed by humans. According to Patrick Meier's update post on the project, the system can already automatically identify tweets containing:

- informative content (in contrast to personal messages or information unhelpful for disaster response)
- eye-witness reporting
- pictures, video footage, broadcast media mentions
- reports of casualties and infrastructure damage
- reports of people missing, seen and/or found
- messages of caution and advice
- calls for help and important needs
- offers of help and support[111]

The team has classified groups of tweets for several types of disaster to train algorithms to find others like them. Additional modules will allow additional analysis of otherwise unwieldy volumes of tweets. Similar projects include Social Media Tracking and Analysis Software (SMTAS) by Mississippi State University's Social Science Research Center, which aggregates data from multiple social networks to provide better contextual understanding to responders.[112] Another example is the

[111] Meier, "Update: Twitter Dashboard for Disaster Response."
[112] Cosby and Mohanty, "Social Media Tracking & Analysis Software."

open source CrisisTracker platform, under development at Madeira University. The platform mines Twitter in the wake of a disaster and automatically clusters messages to facilitate crowdsourced organization of the large volumes of data.[113]

Representation Limits

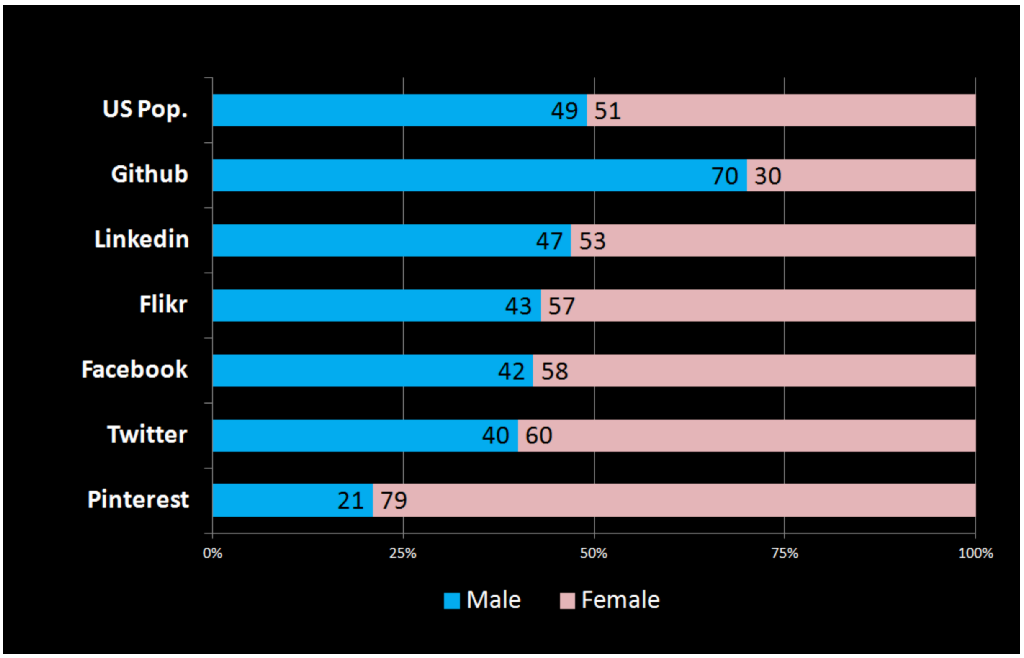
There are some clear limits to social media listening at this point in time. Twitter is the most consulted social media platform as a result of its default towards publicly available data, but it is not entirely representative of the general public. Social network users skew younger, more female, and than the general US population. Hispanics and Asians are slightly underrepresented on Twitter (by about 3% each).

The demographics that make up Twitter and other online platforms are rapidly changing (the service nearly doubled its number of users in 2012) and may be more democratic than cynics suppose. According to the Pew Research Center, 67% of US internet users are on Facebook, and 16% use Twitter. Twitter is especially appealing to adults age 18-29, urban residents, and African-Americans.[114] These numbers are significantly higher than they were just a few short years ago, and African-Americans' heavy usage of Twitter is a reversal of years' worth of findings concerning the "digital divide." The dominance of female

[113] Rogstadius, "A New Tool for Collaborative Social Media Analysis in Disaster Response."
[114] Brenner and Duggan, The Demographics of Social Media Users — 2012.

users on social networks like LinkedIn, Flickr, Facebook, Twitter, and Pinterest likewise reverse years of concern over a male-dominated web. Regardless, it's clear that various social media platforms skew different ways, demographically, and attempts to monitor social media for the emergence of population needs must be keenly aware of representation issues (especially in an international context, where platforms vary more widely related demographic data more difficult to attain).

Figure 3.7: Gender amongst users of popular social media sites[115]



Verification Limits

[115] Cosby and Mohanty, "Social Media Tracking & Analysis Software."

Another frequently voiced concern is the veracity of data collected on social media. It is a valid concern, but not the dead-end some formal aid actors assume it to be. The Social Media Emergency Management Camp report found that fear of incorrect data is a major cultural impediment to formal aid organizations' acceptance of participatory media.[116] But the teams building automated listening tools for use in crises operate under the assumption that some percentage of the data could be incorrect, or even downright malignant, and the overall collection of data will still provide a more complete situational awareness picture than responders have today. Or, as Meier puts it: "[P]erhaps we ought to keep in mind that even if only, say, 0.001% of the 20 million+ tweets generated during the first five days of Hurricane Sandy were actionable and only half of these were accurate, this would still mean over a *thousand* informative, real-time tweets, or about 15,000 words, or 25 *pages* of single-space, relevant, actionable and timely disaster information."[117]

[116] III, Wardell and Su, *2011 Social Media Emergency Management Camp Transforming the Response Enterprise*.
[117] Meier, "Debating the Value of Tweets For Disaster Response (Intelligently)."

Meier has written extensively about several emergent methods to verify crisis tweets[118] and Josh Stearns has collected a wide range of tools and methods for verifying the information contained in social media.[119] One robust example is SwiftRiver, a product in the Ushahidi family. The product seeks to help users manage the large volumes of data generated by social media with an interface that allows users to weight and filter the streams in real-time.

Meier has also detailed the large percentages of crisis tweets that contained useful, actionable information in a collection of past crises.[120] The amount of actionable information the social media posts contain vary between crises and (significantly) across nations, but in every case, they offer novel, actionable information in some volume.

The Pew Research Center's Project for Excellence in Journalism found News and Information to be the largest category of tweets sent during Hurricane Sandy, more than photos, jokes, prayers, or political commentary.[121] Another forthcoming study analyzes Reddit threads discussing the storm, and finds that perspective-based imagery and other citizen reporting outweighed and outperformed links to professional news reports on the social news site.[122]

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[118] Meier, *Verifying Crowdsourced Social Media Reports for Live Crisis Mapping: An Introduction to Information Forensics*.
[119] Stearns, "Verifying Social Media Content: The Best Links, Case Studies and Discussion."
[120] Meier, "Debating the Value of Tweets For Disaster Response (Intelligently)."
[121] Pew Research Center, *Hurricane Sandy and Twitter*.
[122] Leavitt, forthcoming

The primary takeaway of social media's contribution to situational awareness may be that the information it contains is still a major leap forward for situational awareness, even if the data is polluted with some inaccurate information. It's important to note that most practitioners building social media listening tools and libraries do so in the hopes of augmenting existing needs assessment methodologies, not to outright replace formal methods with untested systems. These complementary systems can improve traditional needs assessments with real-time data and the improved geolocation of needs.

Social Media for More Complete Needs Assessments

Formal aid groups conduct needs assessments in the aftermath of a crisis to determine the affected population's needs, including the severity of needs and relative priorities of competing demands. Needs might include rescue from immediate harm, emergency shelter, protection from disease, or long-term economic development. They are established from a range of data sources, including interviews and professional observations. Needs expressed by affected populations on social media, on the other hand, are immediate appeals for help expressed in real time. Requests for help on social media offer metadata such as a timestamp and a point of contact, and sometimes, a geographic location, but they can just as easily lack some of the crucial data needed to send help.

Methods to analyze social media for improved situational awareness present challenges. But formal needs assessment methodologies could benefit from the additional timely information. The United Nations Office for the Coordination of Human Affairs (UNOCHA) mapped the plethora of humanitarian assessment initiatives in its Assessment and Classification of Emergencies (ACE) project.[123] These include, for example, the SPHERE project and the International Federation of Red Cross and Red Crescent Societies Emergency Assessment methodology. The final report documents "increasingly strong calls for improved assessment" from the Tsunami Evaluation Coalition, the UN Humanitarian Response Review, and the UN Reform Process.

The report also produces the key finding that there is "need for more timely information at the onset of an emergency." Many existing needs assessment tools fail to distinguish information collected at the early onset of a crisis (the first hours) versus information gathered weeks later. Real-time, timestamped social media data is of clear value in this context. To the extent that such communications are publicly-shared, they are also easily shared between organizational siloes and stages of response. (It is worth noting that this report was published in

[123] UN OCHA, *ASSESSMENT AND CLASSIFICATION OF EMERGENCIES (ACE) PROJECT: MAPPING OF KEY EMERGENCY NEEDS ASSESSMENT AND ANALYSIS INITATIVES*.

2009 after meetings in 2007-2008, so its findings and the deliberations leading to it predate the emergence of mature social media listening crisis platforms).

This report alone outlines only global assessment initiatives, illustrating that there are many ways to gather and measure the needs of an affected population. The report did not attempt to map the many systems developed at the field level, by donors, or early warning and monitoring systems.[124] Given that no one metric or collection process will be perfect, needs assessments should include primary data collected from as many perspectives as are available, especially including social media. The wide range of needs assessment methodologies and variation amongst formal aid actors in their abilities to execute suggest that we take care to integrate social media data across the board, and not merely as a siloed additional method. The challenge may be not to further complicate the plethora of existing needs assessment systems while delivering the aggregate value of social media messages sent by affected populations.

[124] Ibid., p4.

Social media listening could possibly complement the Initial Rapid Assessment (IRA) tool, as one example. This field reporting system was designed to rapidly assess needs qualitatively from a wide range of sources and features a more flexible sampling methodology.[125] The form-based IRA has met resistance from country teams in Kenya, Bangladesh, and Myanmar due to its length.

Another needs assessment initiative well-positioned to benefit from social media data is EmergencyInfo, "a decision support system based on DevInfo database technology."[126] The system specifically focuses on capturing data and assessing situations within the first 72 hours of an emergency. Lastly, these systems should be properly field-tested as they are integrated into needs assessment toolsets.

Data Preparation and Crisis Mapping

Digital humanitarian groups have also led the charge in collecting, parsing, verifying, and visualizing large amounts of crisis-related data. This area of aid – improving situational awareness of formal aid decisionmakers with information collected online – has proven to represent a sweet spot at the intersection of skills digital volunteers hold and functions professional crisis responders have yet to adequately adopt. This general space is often referred to as crisis

[125] Ibid., p16.
[126] Ibid., p33.

mapping, because the output is commonly a single map of the affected area with many layers of data.

Crisis maps are an early, successful, and oft-cited example of V&TC involvement. The maps and the work they represent have benefitted both formal aid groups and affected populations, but we must not limit our expectations of participatory aid to the production of maps. Although maps are often the primary visual artifacts, their production can require teams of digital volunteers to collect, clean, analyze, translate, distribute, and visualize crisis data in addition to applying geocoordinates. They are living documents, with lifespans of utility.

The process of producing a high quality crisis map from messy (or missing) data has led volunteer groups like Standby Taskforce to codify distinct volunteer teams to manage each step in the process. These teams provide a useful overview of the many different skills digital volunteers can contribute to efforts to improve situational awareness, including but not limited to mapping:[127]

- Task Team: general microwork and support of other teams, ideal for new volunteers who have not yet been trained
- Media Monitoring team: identify information feeds for useful social and mainstream media sources, monitor the feeds, input data into the mapping platform, and flag information that needs translation

[127] Iacucci, *Libya Crisis Map*.

- SMS team: processes and flags actionable messages sent to an established shortcode
- Technology team: provides support installing, configuring, and maintaining technical platforms like Ushahidi and FrontlineSMS
- Geo-Location team: identifies precise GPS coordinates for Media team's reports, information submitted via web, email, or SMS, or information requested by formal aid organization
- Satellite Imagery team: tags features identified in satellite photos as requested by formal aid organizations, such as destroyed buildings
- Translation: translates media reports and submitted information into English, and occasionally, the local language
- Verification team: verifies reports uploaded to mapping platform, checks the credibility of the sources of the reports via online identities and on-the-ground networks, and triangulates reports and information
- Data team: Curate data, share data, map data, and support after-action reports with findings and visualized data
- Analysis team: produces printable maps and identifies patterns in incoming reports
- Reports team: organizes data into reports for formal aid decisionmakers and serves as a quality control layer for other teams' reports

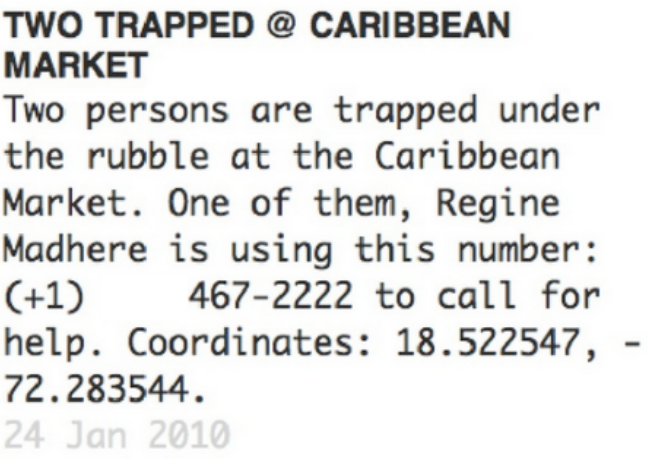








Figure 3.8: Example of SMS for help from Haiti earthquake[128]



There is very real value in this work. "The ability to use social media tools to gather essential elements of information quickly and to develop a common operating picture with that information is a compelling case for adoption in a profession in which success is often tied to timeliness."[129] Craig Fugate, Administrator of FEMA, tweeted that the OpenStreetMap crisis map "represents the most comprehensive and up-to-date map available to the humanitarian community" (although he did not play a formal role in the Haiti response).[130]

The Standby Task Force is one of several V&TC groups that collect and parse data to produce crisis maps. Others include Humanity Road, Crisis Commons, Humanitarian OpenStreetMap, MapAction (whose volunteers physically fly into disaster zones to build

[128] Sultan, "Crisis & Interaction Design."
[129] Wardell and Su, p9
[130] Meier, "How Crisis Mapping Saved Lives in Haiti."

their maps), and Info4Disasters (which collects information before disasters occur). Some mapping projects are designed to directly inform the affected population, but many seek to improve situational awareness of the formal aid decisionmakers. Some maps accomplish both ends, but other crisis map projects are kept private to protect sensitive data or, as initially occurred in the production of the Libyan crisis map, help local sources avoid the negative perceptions attached to working with Western organizations in an internal conflict.[131]

Mapping volunteers range from GIS professionals to lay people, and the sophistication of the maps they produce can range from basic mapping of geographic features to complicated data plotting. The GEO-CAN network is an example of a professional network volunteering to rapidly assess damage using remote sensing imagery.[132] For an overview of the basic challenges inherent in crowdsourced damage assessment mapping and a challenge to the interpretation of "mapping" as a discrete task, see Kerle.[133]

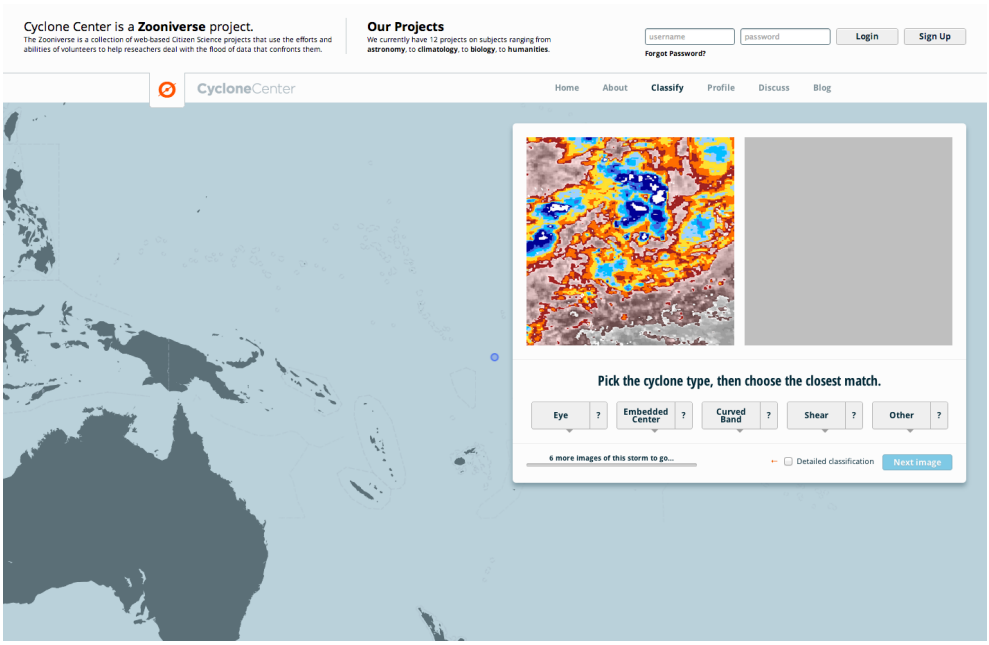
Other crowdsourced microwork can be broken into even more discrete tasks. This work is less complicated and doesn't require the semi-formal team structure or group formations of V&TCs. Bulk

[131] Iacucci, *Libya Crisis Map*.
[132] Barrington et al., "Crowdsourcing Earthquake Damage Assessment Using Remote Sensing Imagery."
[133] Kerle and Hoffman, "Collaborative Damage Mapping for Emergency Response: The Role of Cognitive Systems Engineering."

translations and image assessment, for example, can allow large numbers of minimally-trained volunteers to contribute with varying increments of time. The Zooniverse crowdsourcing platform has been used to run humanitarian image assessment projects, such as the Cyclone Center, where volunteers are asked to classify 30 years' worth of tropical cyclone satellite photos.[134] The Sparked microtasking platform also leverages crowds of volunteers for quick, pro-social engagements that respect busy schedules.[135] Lastly, CrowdCrafting is an open source microwork platform to distribute work amongst volunteers, rather than paid workers.[136] SBTF used CrowdCrafting as part of their response to Typhoon Pablo in the Philippines.[137]

Figure 3.9: Zooniverse crowdsources decades' worth of satellite typhoon imagery

[134] http://www.cyclonecenter.org/
[135] http://sparked.com
[136] http://crowdcrafting.org/about
[137] Meier, "Digital Humanitarian Response: Moving from Crowdsourcing to Microtasking."



Crowdsourcing New Types of Data

The analysis of public social media data has become quite popular (and common) amongst researchers. Safecast's work following the earthquake and Fukushima nuclear disaster in Japan is an excellent example of a project that crowdsourced difficult to obtain data: radiation contamination data collected by Geiger counters.

Safecast is also a unique example because the project was designed to give the affected population itself improved situational awareness of the greatest radiation risks in Japan. The Japanese government was unhelpful in releasing the radiation contamination data they had to the public, so members of the public responded by collecting their own. They designed car-based Geiger counters and enlisted taxis and delivery services to cover additional ground.

Safecast's work required redesigning Geiger counters for modern times, and they succeeded in building cheaper, more compact, and open source units than existed when they themselves went looking. Safecast has now sold over 250 of these units in Kickstarter campaigns.[138] Safecast is now expanding to monitor air pollution in Los Angeles.

[138] http://www.kickstarter.com/projects/seanbonner/safecast-x-kickstarter-geiger-counter

3.3.5 Professional Skills Donation

Law firms have offered pro bono legal services since President John F. Kennedy's Lawyers' Committee for Civil Rights Under Law.[139] The basic premise is that rather than volunteer to complete menial labor, volunteers instead give their time doing what they're best at. This donation of services can prove quite valuable to recipient organizations, and technology promises to help significantly scale this win/win formula.

Several social organizations have updated the pro bono model for the digital age. In the participatory aid space, we have already mentioned a number of projects and organizations that leverage the volunteer time of talented professionals to contribute towards relief efforts. Most V&TC groups are comprised at least partially of volunteers who give their professional talents to the groups' projects.

The Digital Humanitarian Network

The Digital Humanitarian Network is a confederation of V&TC organizations, many of which are featured elsewhere in this case library. The groups are worth noting again here because several of these

[139] "Lawyers Committee for Civil Rights." This tradition continues today at countless law firms, as well as through programs like the American Bar Associaton's Rule of Law Initiative (http://www.americanbar.org/advocacy/rule_of_law.html), which works to strengthen legal institutions in developing nations.

organizations provide specific professional skills to help crisis responders and affected populations.

GISCorps

GISCorps is a prime example of an "expert crowd." This volunteer group is comprised of hundreds of GIS professionals with an average of 8 years' experience. 40% of the volunteers have taught GIS.[140] The group's 113 projects have supported humanitarian and social organizations alike; time is set aside to support small non-profits that would not otherwise be able to fund GIS projects. Organizations requesting GISCorps's services submit a job description, and then speak with leaders like Shoreh Elhami to properly scope the GIS request. The group takes on about 15 projects a year, and even Elhami, the group's director, maintains a full-time career position, which she must take time off from to support the intense schedule crisis management requires. The group also collaborates regularly with other V&TC groups to provide the GIS requirements of projects.

Statistics Without Borders

Statistics Without Borders is a group of 500 professional statisticians within the American Statistical Association.[141] The ASA's leadership established pro bono work as a priority of the professional

[140] Elhami, Shoreh. Personal interview. February 7, 2013.
[141] "Statistics Without Borders."

association, leading to SWB, a group eager to their expertise to humanitarian actors. The volunteers can scope and solve complex statistical challenges for aid efforts.[142] Like GISCorps, the group also provides non-crisis pro bono work to social organizations.

Translators Without Borders

Translators Without Borders provides similar pro bono services to translate between languages (with over 8 million words translated so far).[143]

DataKind

DataKind connects data-savvy researchers to social organizations through fellowship placements (DataFellows), a distributed network of pro bono volunteers (DataCorps), and occasional weekend events in select cities (DataDives).[144]

On-call Scientists

While not a member organization of the Digital Humanitarian Network, the Advancing Science, Serving Society association, inspired by GISCorps, runs a similar pro bono program called On-call Scientists.[145] The initiative invites behavioral, life, physical, and social

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[142] Furlong, Cathy. Personal interview, March 10, 2013.
[143] Borders, "Translators Without Borders."
[144] Davis, "DataKind's Vision of a Data-Driven Social Change Movement." DataKind's website is at http://datakind.org/.
[145] AAAS, "On-call Scientists."

scientists, engineers, technicians, medical professionals, and public health practitioners to participate. Since 2008, the project has recruited 753 scientist volunteers, fielded 39 requests from human rights organizations, and has matched 143 scientists to human rights organizations.[146] Engagements range from fielding discrete scientific questions to formal, long-term placements. The initiative lists a wide variety of ways scientists can contribute domain-specific as well as general scientific knowledge to human rights work:

- Statisticians advising on good survey research methods to measure mass displacement
- Climatologists reviewing a report on a human rights-based analysis of the impact of climate change
- Sociologists developing indicators to measure project objectives
- Geographers mapping incidents of discrimination
- Public health professionals crafting appropriate health care policies to meet the right to health
- Geneticists providing guidance in identifying victims of atrocities
- Hydrologists providing training in water testing for work on the human right to water
- Scientists of all disciplines can answer questions related to scientific method as well as data analyses and interpretation

[146] Ibid.

(Excerpt from AAAS)[147]

Pro Bono Networks

Outside of the strictly-defined formal aid space are two social ventures perfecting the art and science of scaling pro bono projects with the help of ICT.

Catchafire

Catchafire is a social venture based in New York City. The company charges social organizations a small percentage of the market value of the donated pro bono services they arrange, and in exchange, employs program managers to keep projects within scope and on-track. Charging a nominal fee for work also requires nonprofit clients to consider their listings more carefully.

Catchafire helps nonprofits create Project Templates and mini-RFPs to help the client identify and properly scope their needs.[148] This is a shift from the volunteering platforms that list seemingly endless number of less structured opportunities (think eHarmony's matching of dating profiles vs. Craigslist's unstructured list of links). By carefully defining the scope and time commitment, Catchafire stands a better chance of attracting working professionals. This model is based on hundreds of interviews with nonprofits and working professionals.

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[147] AAAS, "How Scientists Can Help."
[148] Catchafire, "How Catchafire Works."

Catchafire's project menu[149] illustrates the impressive range of professional skills their volunteers can provide as aid:

- Accounting and Finance
- Bookkeeping
- Financial modeling
- Investment Advice
- Microsoft Excel Training
- Design
- Art and Illustration
- Brochure Graphic Design
- Infographic
- Letterhead & Business Card
- Fundraising
- Crowdfunding
- Donor Relations Strategy
- Fundraising Plan Review
- Grant Proposal Budget
- Human Resources
- HR Systems
- HR Talent Plan
- Leadership and Culture
- Culture Coaching
- Leadership Coaching
- Marketing
- Annual report writing
- Brand messaging
- Branding Tune Up
- Copywriting
- Multimedia
- 1-3 minute video (editing only)
- 1-3 minute video (filming & editing)
- Motion graphics video
- Photo essay
- Public Relations & Communications
- Communications Materials Review
- Communications Plan
- Event Planning
- Press Kit & Distribution
- Social Media
- Social media campaign and execution
- Social media starter plan
- Strategy
- Board structure strategy
- Business plan development
- Technology
- Google Office Suite (Google Apps) Setup
- Salesforce Database Customization

The organization's most requested roles are public relations, marketing, social media, and design (including web design).

Taproot Foundation

The Taproot Foundation[150] also offers pro bono professional aid to qualified social organizations. Their model is different from Catchafire's in that

[149] Catchafire, “Launch a Project.”
[150] http://www.taprootfoundation.org/

they offer the services to nonprofit clients for free, but the project cycle is longer. The foundation works in only five US cities, because they have found face to face meetings to be critical to project success. Project teams of five members are assembled by a professional team leader from a skills bank of many potential pro bono volunteers.[151] Nonprofit clients and pro bono professionals are each thoroughly vetted by professionals in the same sector, in phone interviews and in-person orientation events, before they can be recruited to a project. Once vetted and orientated, professionals are added to a Customer Relationship Management database where they await recruitment to a project. This process can take months, creating some loss of enthusiasm. The Taproot Foundation's most popular pro bono roles are legal counsel, marketing, human resources, and financial and administrative support.[152]

[151] Hanneman, Alethea. Personal interview. November 12, 2012.
[152] The Taproot Foundation, *Powered by Pro Bono*.

3.3.6 Attention as Aid

"Because after all, the way everything is remembered is by the writers and painters of the period, nobody really lives who has not been well written about"

– Gertrude Stein[153]

Our View of the World is Distorted by Our News

Alisa Miller's TED Talk[154] brilliantly illustrates what news industry observers have been warning for years: Our news diet is distorted. Americans get very little news about places outside the United States, and that amount dwindles further when we remove US-occupied countries like Iraq from the equation. If you look at our supply of news from places outside the United States that the United States is not

[153] Stein, *Paris France*.
[154] Miller, "The News About the News."

directly involved in, the effect is even more pronounced. The Media Standards Trust quantified a similar trend in the United Kingdom in their Shrinking World report, where they found that the British press had placed less priority on international news by every measure, from total words written to front page surface areas.[155]

The professional media coverage news consumers receive drives awareness of and ideas about other places, but this coverage is distorted by a variety of factors. H. Denis Wu analyzed international news coverage in 38 countries and identified the factors which determine how much news each country receives about the rest of the sample. These systemic factors included "traits of nations [like population and extent of freedom of the press], magnitude of interaction, relatedness between nations, and logistics of news gathering" in those countries.[156] The United States is the most-covered nation in Wu's analysis. The international news Americans see depends most closely on trade volume and whether or not a news companies invested in a news agency in the countries in question.[157]

[155] Moore, *Shrinking World*.
[156] Wu, "Systemic Determinants of International News Coverage: a Comparison of 38 Countries."
[157] Ibid.

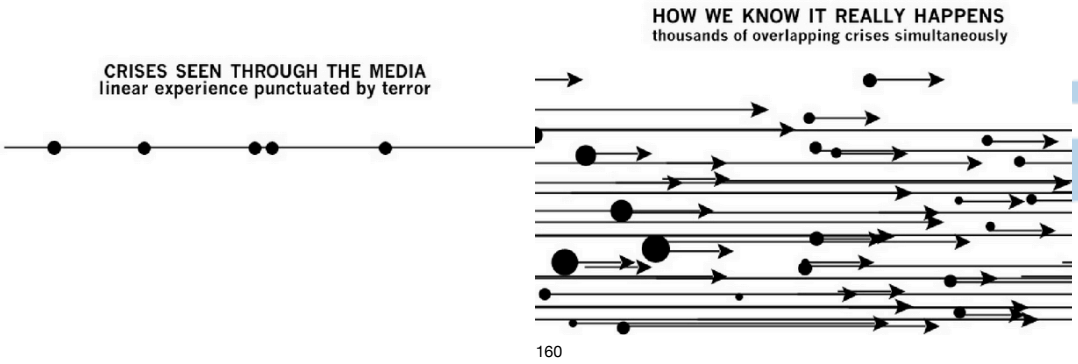
News Coverage of Crises Not Dependent on Severity

Professional media attention to crises can be quite fickle, depending on where in the world the crisis occurs, the type of crisis, and which other (unrelated) events have occurred in the same news cycle. Thomas Eisensee and David Strömberg analyzed the effect of mass media on US government response to nearly 5,000 natural disasters over 34 years in *News Droughts, News Floods, and U.S. Disaster Relief*. They found that for every person killed in a volcano eruption, 40,000 must die from drought to receive the same probability of professional media coverage in the United States. Similarly, 40 times more people must die in an African disaster to achieve the same expected media coverage as the same magnitude of disaster in Eastern Europe.[158] There's no guarantee that a crisis in one's community will become well-known news, no matter the severity of the calamity. Research has found that the scale and impact of a natural disaster is poorly correlated with the amount of media attention to follow.[159]

Our experience of crises, as mediated by the news media, produces a distorted perception where only a limited number of crises reach our attention, and for a variety of reasons that may not be

[158] Eisensee and Strömberg, "News Droughts, News Floods, and U. S. Disaster Relief."
[159] Adams, "Whose Lives Count? TV Coverage of Natural Disasters."

connected to our own allegiances, passions, and capacity for empathy. Zack Sultan visualizes the contrast between crises as mediated by the nightly news and reality:



160

UN-OCHA's Central Emergency Response Fund (CERF) exists "to even out funding disparities and highlight 'forgotten' or 'neglected' emergencies such as the long-standing Sahrawi refugee operation in Algeria."[161] As one might guess after seeing the results of Eisensee and Strömberg's study, there are many under-reported crises: "Since 2006, US $900 million have been allocated from CERF to neglected crises in more than 40 countries."[162]

Economist Herbert Simon posited that as larger volumes of information vie for our attention, attention itself becomes a scarce and

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[160] Sultan, "Crisis & Interaction Design."
[161] United Nations, "UN Emergency Fund Gives US $100 Million to Poorly Funded Humanitarian Crises."
[162] Economics, "News Droughts , News Floods , and U . S . Disaster Relief Author (s): Thomas Eisensee and David Strömberg Published by : Oxford University Press Content in a Trusted Digital Archive . We Use Information Technology and Tools to Increase Productivity and ."

thereby valuable commodity.[163] Elements of this theory have been quantified in the aforementioned study: in the nearly 5,000 international disasters occurring between 1968 and 2002, the authors found that the likelihood and degree of official U.S. relief was closely tied to the crisis's position in the news. When major events like the Olympics crowded the news hole, international disasters subsequently received less media attention, and as a result, less aid from the U.S. government. International disasters were found to be 5% less likely to receive any relief during the Olympics compared to baseline news cycles.[164] This study clearly quantifies the stakes that mass media awareness of an international crisis carries, particularly for the crises less likely to make international headlines.

Participatory Media Allows Networked Gatekeeping

In this crowded, distorted media environment, the rise of participatory media contributes to the rise in participatory aid in several ways. We know that attention can influence the amount and duration of disaster relief, as measured by aid money, volunteers, and other metrics. The act of bringing attention to a cause, crisis, or event is now an

[163] Simon, "Rationality as Process and as Product of Thought."
[164] Economics, "News Droughts , News Floods , and U . S . Disaster Relief Author (s): Thomas Eisensee and David Strömberg Published by : Oxford University Press Content in a Trusted Digital Archive . We Use Information Technology and Tools to Increase Productivity and ."

accomplishable feat for an increased number of civilians, and potentially a valuable contribution.

The rise of participatory media has allowed many people to build their own audiences independent of broadcast media, and broadcast media itself has adjusted by mining social media for stories. In this environment, the ability to drive attention itself can be as valuable and donate-able a skill as many other volunteer activities.

Attention Tactics

There are five categories of ways citizens can help provide attention as aid:

1. Citizens can marshal the attention of the broadcast media
2. Citizens can donate the attention of our own audience via social media
3. Citizens can pressure new gatekeepers of attention
4. Citizens can ride pre-existing waves of attention
5. Citizens can donate their visual and storytelling skills

1. Citizens can marshal the attention of the broadcast media

Provide Original Footage

The proliferation of cameras, especially on cellphones, has drastically increased the chances that a person with a camera is among the witnesses of an event. WITNESS was founded in 1988 on the idea that the proliferation of cheap camcorders allows average

people to document human rights abuses. This vision has evolved and stayed relevant as billions of people acquire networked-connected mobile cameras. The events captured by these cameras have already reshaped how we discover and consume video documenting human rights violations (see WITNESS's *Cameras Everywhere* report[165]). We can create and share usable original footage and documentation of events at exponentially greater rates than the analog film era. This global trend has increased the pool of available photos and videos of events for every communications channel, from social media to advocacy groups to broadcast media outlets, the latter of which can license the citizen footage and broadcast it to far larger audiences. Human Rights Watch uses this exact strategy to improve the chances of international violations being picked up by the mainstream media.[166]

Long-running crises, like starvation or climate change, often fail to match the threshold of newsworthiness generated by sudden events. Zack Sultan illustrates this spectrum between the "hot flash crisis" like an earthquake, the "slow burn crisis" like pollution, and the "glacial crisis" like cultural conflict.[167] Some participatory aid projects seeking to deliver attention do so on behalf of long-term crises that have, due to the

[165] Padania et al., *Cameras Everywhere*.
[166] Stempeck, "Look Who's Talking: Non-profit Newsmakers in the Digital Age."
[167] Sultan, "Crisis & Interaction Design."

nature of the crisis, fallen off most of the word's radar. A prime example of this class of project is *Starved for Attention*, a multimedia campaign produced by Doctors Without Borders and VII Photo.[168] The project organized award-winning photojournalists to train their lenses on under-reported malnutrition zones around the world to generate grassroots support for improvements in formal food aid systems.[169]

Pro Bono Media Professionals

Similar to the pro bono work conducted in other professions, publicists can donate their professional attention-driving powers to under-noticed causes. One extremely impactful recent example is the case of publicist Ryan Julison. Julison regularly donates his professional abilities to news stories that he feels did not receive sufficient media attention. When he took on the story of slain teenager Trayvon Martin on a pro bono basis, Julison was able to elevate the already-forgotten story to the national stage.[170] Within one day of joining the effort, Julison got coverage in a syndicated Reuters article and on the national televised CBS *Morning News*.[171] From here, the story went on to become one of the most-covered stories of 2012. The Reuters article itself inspired a

[168] http://starvedforattention.org/about.php
[169] See also http://www.dadaabstories.org/
[170] Stempeck, Zuckerman, and Graeff, "Trayvon Martin."
[171] Julison, Ryan. Personal interview. October 8, 2012.

reader to start a Change.org petition, which eventually garnered over 2 million signatures calling for George Zimmerman's arrest.

Democratize Advertising

The Ad Council was established in 1942 to "marshal pro bono talent from the advertising and communications industries to deliver critical messages to the American public."[172] Crowd-funded ad-buying platforms like Louder offer groups of people the ability to take a page from the government and countless corporations by banding together and placing their own commercials and billboards within traditional broadcast media.[173]

2. Citizens can donate the attention of our their own audiences via social media

Outside of the mainstream media, peer-to-peer attention tactics have become more viable thanks to larger trends in where we look for information and news (see Pew Internet & American Life Project's News research[174].

Amplify Memes

The act of 'liking' a piece of content on Facebook or retweeting something on Twitter is one of the most heavily-criticized actions of all

[172] Ad Council, "Frequently Asked Questions."
[173] "Louder."
[174] Pew Internet & American Life, "News."

the strawmen erected to launch slacktivist arguments. Changing one's profile photo or avatar is a similarly lightweight and equally criticized way people take action to spread awareness.

As I wrote on the day red and pink equality symbols took over millions of Facebook profile photos, "During the 2009 Iranian election protests, hundreds of thousands of Twitter users turned their profile pictures green in solidarity with the protesters. This became the slacktivist strawman everyone had been praying for: naive American Twitter users taking the laziest possible action to support a foreign conflict because it was the cool thing to do. Or, if you were on the other side of the fence, it was the strongest show of solidarity between Americans and Iranians in...ever?"[175]

[175] Stempeck, Matias, and Sauter, "Green Vs. Pink: Change Your Profile, Change the World."

This type of lightweight online action clearly represents a 'thin' type of participation (see Ethan Zuckerman's speech and blog post, "Beyond the Crisis in Civics"[176]). En masse, however, the action could have impact. Facebook found 2.7 million *additional* users changed their profile photos on the day of the equality action.[177] On issues like gay marriage, where peer opinion and experience have been shown to be extremely powerful change agents,[178] widespread support of the equality meme could actually be impactful. The same may be true with widespread symbolic support for under-reported crises, especially given that public awareness could be closely correlated with aid.[179,180] This is a rich area for future experimentation and study.

Leverage average users' social networks to build awareness

Short of targeting influential users, there is evidence that large numbers of less-influential users can still prove influential online. Quantitative research is beginning to emerge from researchers looking at Twitter as well as Facebook's Data Research team on the true reach and interplay of the messages the general public posts to its networks of friends and followers online.

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[176] Zuckerman, "Beyond 'The Crisis in Civics' – Notes from My 2013 DML Talk."
[177] Bakshy, "Showing Support for Marriage Equality on Facebook."
[178] Klarman, "How Same-Sex Marriage Came to Be."
[179] Eisensee and Strömberg, "News Droughts, News Floods, and U. S. Disaster Relief."
[180] Bekkers and Wiepking, "A Literature Review of Empirical Studies of Philanthropy: Eight Mechanisms That Drive Charitable Giving."

A study to quantify influence on Twitter discovered that a marketing strategy of reaching out to users with average and below-average followings could actually, in some cases, be a more effective marketing strategy than eliciting the support of the top influencers.[181] The authors find that the unpredictability of virality suggests those seeking to deliver attention should target large numbers of potential sharers in the hopes of generating a large cascade of retweets with some number of them.

One Facebook study looked at information propagation across 253 million users.[182] The study found that contrary to popular critiques of the influence of weak ties,[183] both weak and strong ties facilitate the dissemination of information and weak ties, in particular, are not only more abundant, but are also found most responsible for the spread of novel information.

Other studies have supported the notion that we pay significant attention to our extended networks of Facebook friends even if we don't communicate with them regularly.[184] Average users underestimate the number of friends and followers they reach online, estimating only 27% of the true reach of their messages.[185] We reach more people than

[181] Bakshy et al., "Everyone's an Influencer: Quantifying Influence on Twitter Categories and Subject Descriptors."
[182] Bakshy et al., "The Role of Social Networks in Information Diffusion."
[183] Gladwell, "Small Change: Why the Revolution Will Not Be Tweeted."
[184] Backstrom, Bakshy, and Kleinberg, "Center of Attention: How Facebook Users Allocate Attention Across Friends."

we think, and collectively, awareness campaigns can have greater self-produced impact than users could imagine even a few short years ago.

Tools of Amplification

Ryan Julison, the publicist that launched the Trayvon Martin story, is not an avid user of social media, but he sees amplifying a message through online sharing as one of the more important actions an activist can take:

"If someone goes out and does a march, that's a one-time news story, that's it. Somebody forwards stories, and engages in propelling information, that leads to so many other things. That continues -- it doesn't just stop with the forward. That forward leads to other forwards, and people share with their friends, and post and tweet about it. I would put online activism, or even just online information-sharing as a pretty high profile way to be an activist."186

Activists agree, and have developed a variety of tools and methods designed to derive value from the simple fact that many of us have developed an audience of people who pay attention to what we share, despite living in an attention-scarce society. Native social media campaigns like FactSpreaders[187] and Reality Drop[188] leverage grassroots supporters to spread empirically accurate information in the face of rumor propagators and climate deniers, respectively. This

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[185] Bernstein et al., “Quantifying the Invisible Audience in Social Networks.”
[186] Julison, Ryan. Ibid.
[187] http://factspreaders.net/
[188] http://civic.mit.edu/blog/mstem/drop-back-to-reality-oh-there-goes-sanity

includes not only tweets and Facebook shares, but also pushing back against trolls in the comments of news articles and elsewhere online.

Another experiment took place prior to the 2012 election, when a research team at University of California Berkeley developed Proposition 30 Tracker.[189] The researchers created a custom affiliate code, share link, and leaderboard to encourage citizens to spread awareness of the ballot proposition to increase sales and income tax or significantly cut state education funding. 889 citizens signed up to participate.

The Thunderclap platform recognizes that Twitter is a noisy stream where individual messages are easily lost.[190] The service coordinates as many supporters of a cause as can be recruited, and then times their tweets to send simultaneously, with the goal to create an unavoidable moment in their followers' streams. By synchronizing amplification, organizers have a new tactic to generate the level of attention received by more 'newsworthy' crises. The campaign to recruit a critical mass of users can itself generate a larger footprint than individual efforts.

[189] http://opinion.berkeley.edu/ca-prop-30-awareness/5965ed08 and http://citris-uc.org/news/2012/09/19/prop_30_project_set_rapidly_expand_knowledge_through_social_networks
[190] https://www.thunderclap.it/

Diaspora populations have also proven adept at distributing information when the home community is out of reach because of political or natural crises.[191] The Kenyans on Twitter hashtag *#KOT*, for example, is a common forum for the diaspora to spread news.

3. Citizens can pressure new gatekeepers of attention

If we each have an audience online, imagine how many people Justin Bieber can reach. Prior to the web, news companies were often described as gatekeepers to mainstream awareness. Technology has drastically altered this landscape, with many more places and ways to be heard online. A new breed of gatekeeper to mass attention has emerged: the individual who amasses a large following on digital communication platforms. This includes web-native celebrities, like bloggers and YouTube stars, but also mainstream celebrities newly empowered to speak directly to their millions of fans without the help of the press. Celebrities on Twitter create an alluring combination for activists: they garner large amounts of attention but offer relatively lower barriers to access. But we should also keep in mind that celebrities and other so-called "online influential" are people, too, and there are ethics you should consider before bombarding someone on behalf of a campaign (see Ethan Zuckerman's post, The Tweetbomb and the Ethics of Attention[192]).

[191] Stempeck, "The Internet Exposes Tensions and Opportunity Between Nations and Their Diasporas."
[192] Zuckerman, "The Tweetbomb and the Ethics of Attention."

In March, 2012, the producers of the aforementioned KONY video teased the film to supporters for weeks before launch, and then shepherded "a network of 5,000 teenage campaigners to bombard celebrities with demands for support" on Twitter and Facebook, reaching 100 million views in six days.[193]

Organizers like Tim Newman at Change.org routinely target celebrities on Twitter to ask them to spread the word about various campaigns and petitions. This tactic was wildly successful in the case of the Trayvon Martin petition, when Newman elicited supportive tweets from Talib Kweli, Wyclef Jean, Spike Lee, Mia Farrow, and Chad Ochocinco, creating a 900% spike in social media traffic to the petition in one day.[194] Later that week, supportive tweets were successfully solicited from John Legend, Cher, and MC Hammer, the latter of whom had 2.6 million followers at the time.

The original Rolling Jubilee campaign page (an extension of the Occupy movement) explicitly asked users to target celebrities like Oprah, Bruce Springsteen, and Louis C.K. with their tweets.[195] This feature was later removed.

Figure 3.10: RollingJubilee.org encouraged users to tweet at various celebrities about the campaign

[193] Cadwalladr, “Jason Russell: Kony2012 and the Fight for Truth.”
[194] Stempeck, Zuckerman, and Graeff, “Trayvon Martin.”
[195] http://rollingjubilee.org/

[196]

4. Citizens can ride pre-existing waves of attention

Memejacking,[197] culturejacking,[198] and newsjacking[199] tactics siphon off attention from wildly popular memes to their causes, with varying degrees of success. Groups like the Harry Potter Alliance[200] leverage their members' fandom of popular fictional works, but also leverage huge media events like Hollywood film premieres to divert some attention towards their issues. Political organizers have long worked to prepare for and ride waves of attention as they come up in the news cycle.

Stories that have already received enormous attention in the mass media have proven alluring targets for those seeking to parlay this attention towards other topics. Stempeck, et al.'s analysis of the Trayvon Martin story found a variety of political actors attempted to

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[196] Ibid.
[197] RAD Campaign, "Memejacking."
[198] RAD Campaign, "Culture-Jacking: Agile Nonprofit Marketing Meets Broadcast TV."
[199] Scott, *Newsjacking: How to Inject Your Ideas into a Breaking News Story and Generate Tons of Media Coverage*.
[200] http://thehpalliance.org/

capture some of the professional media's spotlight by tying their work to the Martin story dominating headlines.[201]

5. Citizens can donate their visual and storytelling skills

Graphic designers hold valuable skills in an attention economy. Designers can contribute their professional skills on pro bono platforms like Catchafire, where design is one of the top-requested services from social organizations.

Pro Bono Graphic Design

Designers Aaron Perry-Zucker and Max Slavkin started the Design for Obama[202] platform in a dorm room to collect poster submissions from designers around the world. They later repurposed the platform to allow designers to contribute their professional work on behalf of the earthquake in Haiti[203] (Design for Haiti) and the tsunami in Japan (Design for Japan),[204] with hundreds of posters submitted, and all sales benefitting aid efforts. The community of designers has evolved into the Creative Action Network, which has begun to organize the creative community around other social issues like gun control.[205]

[201] Stempeck, Zuckerman, and Graeff, "Trayvon Martin."
[202] http://designforobama.org/#about
[203] http://www.designforhaiti.com/
[204] http://designforjapan.tumblr.com/
[205] http://thecreativeactionnetwork.com/

Graphic designers have contributed their talents to other movements and aid efforts, as well. Occupy Design helped brand and communicate a protest movement and its encampments.[206] Like CrisisCamps, Iconathons[207] bring together designers to create public domain icons to improve communication and wayfaring in disaster relief,[208] clean water,[209] investigative journalism,[210] and the American Red Cross.[211]

Participatory Storytelling

Documentarians, reporters, and other storytellers are also well-positioned to drive broader attention to a crisis or the needs of a population, even without a traditional distribution model for their films. Invisible Children's KONY2012 documentary used social media distribute the fastest-spreading viral video of all time.[212] Few would have ever predicted that this title would go to a 30-minute documentary about Uganda.

18 Days in Egypt is an incredibly successful crowdsourced documentary capturing Egypt's revolution through many different

[206] http://occupydesign.org/
[207] http://iconathon.org/
[208] http://iconathon.org/2012/12/11/disaster-relief-icons-now-available/
[209] http://iconathon.org/2012/12/11/clean-water-icons-from-charity-water-iconathon/
[210] http://iconathon.org/2013/03/07/investigative-journalism-iconathon-at-the-new-york-times/
[211] http://iconathon.org/2012/10/31/351/
[212] http://invisiblechildren.com/kony/

perspectives.[213] The film has been screened around the country and world.

The Sandy Storyline project is another participatory documentary to collect stories from the affected communities in New York.[214] The project has collected over 250 individual stories and organized media education for 100 more. The stories have been collected with the help of Vojo,[215] a tool that allows people with landlines and basic cellphones to call in and record their tales to the online collection.

Another major player in this space is Global Voices, a community spanning the globe with hundreds of volunteer writers and translators.[216] These not only capture stories in places that the professional international media neglects to cover, but also translate and contextualize these events to make them relevant to broader audiences in other places around the world. This act of translating, contextualizing, and amplifying stories may well have helped the protests in Tunisia to spread, leading to Ben Ali's downfall and the ignition of the Arab Spring.[217]

[213] http://beta.18daysinegypt.com/#/about
[214] http://www.sandystoryline.com/about/
[215] http://vojo.co/
[216] http://globalvoicesonline.org/
[217] Reporters Without Borders, "Nawaat: Reporters Without Borders Awards the 2011 Netizen Prize to Tunisian Bloggers."

3.3.7 Software Projects

Software development is another professional skill that can be donated, but we consider it separately here because the products of this work, humanitarian software applications, merit a section independent of pro bono services. The work involved in coding and maintaining a software project is of significantly higher value (and personal investment) than the microwork tasks that are frequently used to represent participatory aid. Some of these efforts have been underway for years, and some involve communities of hundreds of remote volunteer developers. Some projects seek to help affected populations by improving the technology at the disposal of formal aid decisionmakers, while others seek to empower the affected population directly. Many serve both sets of users. Unsurprisingly, code travels well over long distances on the web. There is a rich history of open source projects designed and built by distributed networks of volunteers,[218] including several notable projects in the participatory aid space, detailed below.

[218] Benkler, "Coase's Penguin, or, Linux and The Nature of the Firm."

Mapping and Reporting Platforms

Ushahidi is an open source crisismapping and reporting platform.[219] It powers the work of many of the crisismapping groups outlined earlier. The nonprofit offers three products. The flagship Ushahidi application is a self-hosted platform that facilitates crowdsourced information from email, SMS, and Twitter. Ushahidi has also launched a hosted mapping platform, Crowdmap, to aggregate crowdsourced information and visualize it on maps or timelines.[220] Crowdmap also supports mobile "check-ins" for fast, easily geo-located on-the-ground updates.[221] Finally, the aforementioned SwiftRiver product seeks to help manage the large volumes of incoming data generated by social media.[222]

Google.org has continued developing increasingly sophisticated crisis maps[223] (which they refer to simply as "Custom Google Maps").[224] The maps are based on the powerful (and commercial) Google Maps platform, but many of the layers of useful crisis data are generated, collected, or gathered by online crisis responders like the Google.org team.

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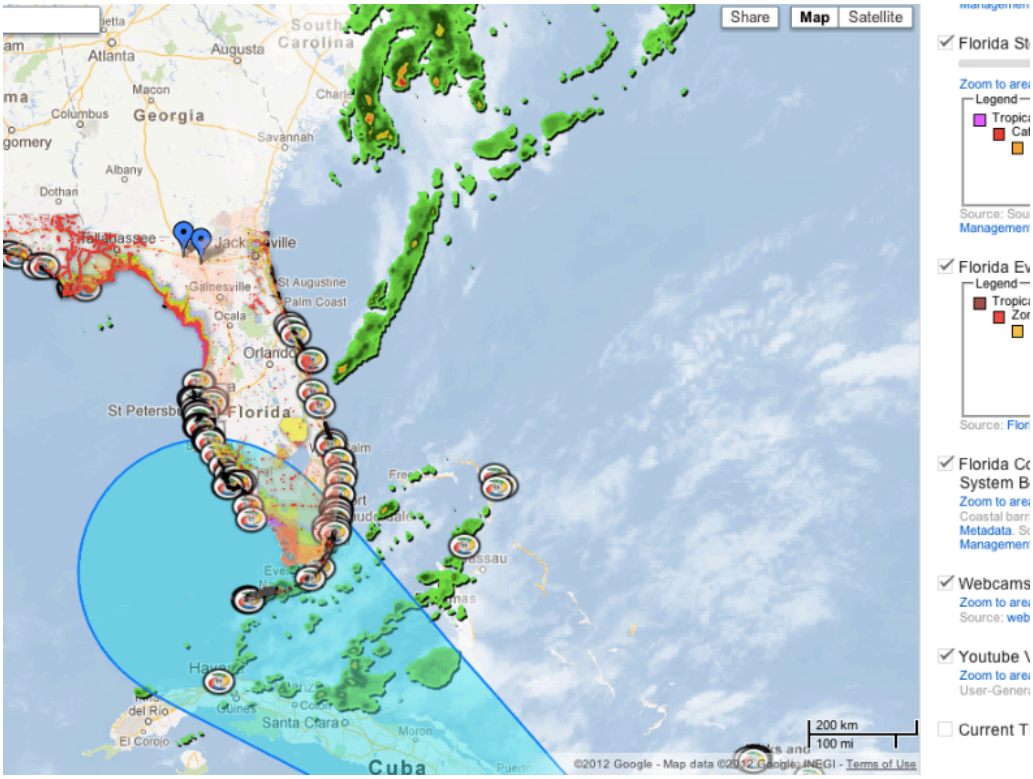
[219] http://www.ushahidi.com/
[220] https://crowdmap.com/
[221] http://blog.ushahidi.com/2010/12/31/announcing-checkins-for-ushahidi-and-crowdmap/
[222] http://ushahidi.com/products/swiftriver-platform
[223] Google.org, "Weather, Hazards, Emergency Preparedness."
[224] http://www.google.org/crisisresponse/resources.html

Figure 3.11: Google.org's Crisis Response maps support various layers of actionable information and visual content



OpenStreetMap (OSM) is a volunteer-driven open alternative to Google Maps. The Humanitarian OpenStreetMap Team (HOT) mobilizes the broader OSM community to assist formal humanitarian actors in times of crisis. The volunteers work remotely and occasionally locally to map geographic data and satellite imagery and meet humanitarian needs. They've worked remotely to help in the Ivory Coast, remotely and locally in Haiti, and preventively in Indonesia.[225] Most recently, HOT used MapMill (see below) in the aftermath of Hurricane Sandy to coordinate the crowdsourced tagging of Civilian Air Patrol images of

[225] Humanitarian OpenStreetMap Team, "About."

damage along the New Jersey coastline. A huge number of images were quickly rated for the apparent degree of storm damage.

The technology powering mapping platforms continues to advance, improving the range of ways maps can aid in crisis situations. OpenIR, the aforementioned platform developed by my MIT Media Lab colleague Arlene Ducao, improves access to allow mapping of the ecological features and risks identified by copious but historically inaccessible infrared satellite data.[226] Another mapping project with origins in the MIT Media Lab is MapMill.[227] This open source[228] Public Laboratory[229] project by Jeffrey Warren allows a community to collaboratively process large numbers of map images, as HOT did with coastline damage following Hurricane Sandy.

Building the mapping platforms themselves is a highly skilled volunteer opportunity. Once deployed, the software invites contributions from a range of skilled or unskilled contributors. These projects invite a range of contributions consisting mostly of collecting, preparing, and plotting crisis data onto the map, as detailed in the Situational Awareness section (3.3.4).

Coordination Platforms

[226] http://openir.media.mit.edu/main/
[227] http://publiclaboratory.org/wiki/mapmill
[228] Code at https://github.com/jywarren/mapmill
[229] http://publiclaboratory.org/home

Software developers also support participatory aid projects by designing and building platforms for coordination. Sahana Software Foundation's EDEN (Emergency Development ENvironment) is a modular open source software project to help formal aid actors manage large-scale humanitarian responses.[230] Collaborators can register organizations' deployed on the ground, track crisis response projects and resources, and manage on-the-ground inventories. The software platform has been developed by a strong volunteer community and occasional interns from Google Summer of Code and other programs.

Following the earthquake in Haiti, and massive influx of thousands of aid groups, remote volunteers helped populate the Sahana EDEN installation with information about the organizations already working in Haiti. Says the Foundation: "The technology community's response to the Haitian earthquake was an unprecedented collaborative and cooperative effort on the part of different organizations to come together and to help each other and to not replicate efforts."

Sahana EDEN also powers other platforms, such as The Disaster Risk Reduction Project Portal for Asia and the Pacific,[231] a platform maintained by UN-OCHA. It's a similar who-what-where information-sharing portal for disaster risk and reduction projects in the

[230] http://sahanafoundation.org/products/eden/
[231] http://drrprojects.net/drrp/drrpp/home

Asia and Pacific region, used to identify areas of cooperation or gaps between projects.

Mobile Crisis Apps

As users access the web via mobile devices in ever-larger numbers, the mobile distinction may fade, but developers have built a variety of mobile-specific software apps to improve crisis response. Taarifa[232] is a mapping and reporting platform and a dashboard for service providers. It's an open source project originally based on Ushahidi code, and works without an internet connection.

FrontlineSMS[233] is another open source project that functions without a data connection. This SMS gateway is the premier open source product to collect text messages sent from the public to an SMS shortcode. Also noteworthy is Sukey, a mobile app designed to leverage geocoordinates and crowdsourced reporting to help student protesters in London avoid police kettling in tuition protests.[234]

Match Needs & Resources

A variety of projects have sought to help scale matching of the affected community's needs with sympathizers' offers to help. The matching logic behind these projects ranges between artificial intelligence

[232] http://taarifa.org/
[233] http://www.frontlinesms.com/
[234] Geere, "Sukey Protest App."

and crowdsourced human matching and everything in between, with few successful examples. Meier has proposed a hybrid of artificial intelligence and crowdsourced microwork to solve this challenge (and has begun building a solution employing this strategy with the aforementioned AIDR).[235]

There are significant safety and privacy concerns with projects that publicly map individuals' needs, as posting such information can open those in need up to unscrupulous solicitations from price-gouging contractors or other complete strangers. In some crises, the variety of needs-matching efforts also risks fragmentation of reporting and aid delivery.

Following Hurricane Sandy, NY Tech Meetup and New Work City managed simple skills and needs collection forms using Google Drive to allow members of the affected population to request technical work the groups could fulfill. [236] They hosted a similar form to recruit skilled volunteers to execute the jobs. These forms echo similar efforts conducted by formal needs assessment programs, with the major differences being that they are online and administered by fellow citizens.

[235] Meier, "A Research Framework for Next Generation Humanitarian Technology and Innovation."

[236] https://docs.google.com/spreadsheet/viewform?formkey=dHRJZk9uSmFycld2TW5tbDNfaFpneEE6MQ

Recovers.org hosted a similar form combination with their well-designed Need / Have pages.[237] According to an email with Recovers.org,[238] form data went into a database where matching was then completed manually by volunteers, including teams from another organization, nPower.[239] Each volunteer was assigned to manage needs in the database for a set number of hours each week. Volunteers logged in, reviewed unmet needs, contacted the individuals who made the requests to clarify the needs, annotated the case, and attempted to complete a match with local resources. Complicated questions were run up the flagpole to the Recovers.org coordinator of the effort, Chris Kuryak. In one month, the nPower volunteers managed 148 needs and fulfilled 26. Needs included hot meal delivery, electrical work, and mold remediation.

The disconnect between fulfilled needs and the thousands who offered their aid using these forms exposes a remaining challenge for all needs-matching projects: needs are not always clear, the people who request help are not always reachable, and the people who offer their assistance are not always easily matched to needs. Another effort in this space is Castaneed, which is no longer online, and attempted to map and actively broadcast emerging needs

[237] https://lowereastside.recovers.org/
[238] Kuryak, Chris. Personal correspondence. March 4, 2013.
[239] http://www.npower.org/

on Twitter. Sandy Need Mapper[240] is a related crisis hackathon project, which allowed the affected population to post needs by SMS and responders to mark needs fulfilled with a simple SMS saying 'Done'.

In the broader participatory aid space, HopeMob harnesses the power of individual story and a more approachable scale, with one story per day. Twitter followers of @hope then provide help in a many-to-one model of participatory aid.[241]

[240] http://www.needmapper.com/
[241] http://hopemob.org/

3.3.8 Crowd Cognition and Creativity

As discussed in Section 2.3, ad hoc actors and semi-formal groups can develop creative solutions to new and longstanding problems. The right combination of transparent information, skilled volunteers, and communications technologies can support mass collaboration between previously unconnected individuals. This blend can produce creative solutions to problems insufficiently addressed by formal aid structures (such as the example of the Russian Fires Crisis Map). These efforts tend to focus on helping the affected population directly with microwork or megawork.

The public's ability to take creative action without permission can occasionally lead, however, to projects and efforts developed with no meaningful output. Significant effort is occasionally invested in projects that do not have sufficient ties to the situation on the ground or do not meaningfully contribute to recovery efforts. This failure can be the result of the project team's failure to properly investigate the space before building, or a lack of meaningful channels for public participation (or both).

A successful example of mass collaboration in action can be found in the case of the Russian wildfires of 2010. Gregory Asmolov started a mutual aid collaboration platform, Russian Fires Crisis Map,

when it became clear that the state-influenced Russian news media were not able to cover the full degree of the forest fires ravaging large portions of the country. Citizens took on the role of repurposing the Ushahidi platform to curate and distribute information via participatory media.

Then, as it became clear that the official government response was inept, the same organized citizens developed the Rynda.org platform to not only hold officials accountable for their inaction, but also to organize citizens to take the action the formal institutions had failed to execute.[242] (In doing so, Rynda.org bridges the spectrum between crisis response and civic activism).

Examples like Rynda.org remind us that not all 'crowd' labor is rote labor. Kate Starbird has written on how volunteers converge on social media following a crisis to improvise creative solutions the way a crowd converges to problem-solve in the aftermath of a crisis in physical space.[243] "The crowd" can rapidly decide on and execute complicated issues, and not merely by providing a corpus of opinions for someone else to average, as described by the phrase "wisdom of the crowd."[244] The right combination of transparent crisis information,

[242] Asmolov, "Crisis Mapping & Crowdsourcing as a Tool of Mutual Aid."
[243] Starbird, "'Voluntweeters': Self-Organizing by Digital Volunteers in Times of Crisis."
[244] Surowiecki, *The Wisdom of Crowds: Why the Many Are Smarter Than the Few and How Collective Wisdom Shapes Business, Economies, Societies and Nations*.

skilled volunteers with some level of self agency, and communications technology can result in mass collaboration between previously unconnected individuals. This blend can result in creative solutions to problems insufficiently addressed by formal aid structures. The public's ability to take creative action without permission can occasionally lead, however, to projects and efforts developed with no meaningful output. Significant effort has occasionally been invested in projects that do not have ties to the situation on the ground or do not meaningfully contribute to recovery efforts. This failure can be the result of the project team's failure to properly investigate the space before building, or a lack of meaningful channels for public participation (or both).

Hackathons as Research & Development Drivers

The participatory aid sector was early in adopting the now-ubiquitous hackathon as an event format that simultaneously recruited new talent to the space while building the bonds of community within it. Crisis-specific hackathons were early forums for creative solutions to crisis needs, and the inspiration for many of today's V&TC groups. CrisisCommons, the early convener of crisis hackathons, has coordinated CrisisCamp response events since 2009, bringing together over 3,000 people in over 30 cities around the globe.[245]

[245] http://crisiscommons.org/about/

Random Hacks of Kindness[246] runs two software hackathons a year and inventories the resulting projects on their website.[247] One of the more technically equipped V&TC groups, Geeks Without Bounds, hosts humanitarian hackathons around the world and accelerates the most promising projects that emerge.[248]

Not all of the code that emerges from a hackathon weekend is usable, and there can be a concerning lack of communication between those requesting projects and those building projects. This broken feedback loop has led to projects that don't fulfill their lofty ambitions. Still, hackathons serve as a valuable model for convergence of talent, including many volunteers who would otherwise have little or no interaction with the aid sector.[249] Given the relatively high commercial value of software development, the regular influxes of help developers donate immediately following crises is a significant subsidy of the aid sector's tool development.

Cultural Needs

The informal groups that constitute participatory aid efforts may actually be better suited to address the social and cultural needs a community has in the aftermath of a crisis. For example, few traditional

[246] http://www.rhok.org/
[247] http://www.rhok.org/solutions
[248] http://gwob.org/
[249] Willow Brugh is currently studying how to maximize the benefits of this type of event and scale the ad hoc organizations that can emerge while working to improve impact.

aid groups predicted the need for coworking spots in the aftermath of Hurricane Sandy in New York until the Sandy Coworking map was launched. The map served a real community need, and never would have happened if the community members themselves weren't newly empowered to organize themselves to fulfill local needs (building on the shoulders of an earlier participatory aid effort with Ushahidi's Crowdmap platform).

The closer relationship communications technologies allow between those in need and those able to offer help broadens the spectrum of what we might consider aid, well beyond the UN Cluster system's official categories. Direct communication with local groups, when properly coordinated, allows for an improved feedback loop. It would be unrealistic to expect formal aid organizations to identify and deliver the entire range of human needs following a crisis. The rise of participatory aid allows the rest of us to fill less critical needs that are also less easily delivered in a formal aid convoy, such as forming shared memories of the traumatic event or helping with wedding relocations. Mutual aid shines in the gaps created by formal aid structures, not entirely unrelated to Hakim Bey's Autonomous Zones of creative spaces found within and throughout hierarchical systems.[250]

[250] Bey, *The Temporary Autonomous Zone, Ontological Anarchy, Poetic Terrorism*.

The Hurricane Hackers hackathon produced Remembers,[251] a crowdsourced memorial platform for those who lost their lives in a crisis. A simple spreadsheet of information automatically generates a beautiful crowdsourced memorial gallery to remember and share the stories of the deceased.

Hurricane Sandy also displaced thousands of wedding parties. As happy couples and thousands of wedding industry professionals alike scrambled to reschedule and meet commitments, wedding website TheKnot.com launched dedicated Facebook Pages to help reschedule and connect wedding professionals in need of business support.[252, 253]

Storytelling is important to bringing attention to under-reported crises, as discussed earlier, but it also plays a role in long-term cultural recovery and understanding of major events. Community narratives can reframe history and instill new knowledge around response and recovery.[254] In addition to aforementioned documentary projects like 18 Days in Egypt, a number of participatory archiving projects are underway to remember Japan's March 11 disasters.[255] Expect participatory aid efforts to continue inventing new ways to help the affected population

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[251] Site: http://timenesia.org:8000/. Hurricane Sandy example: http://timenesia.org:8000/p/hurricane_sandy_memorial_project/. Code: https://github.com/b1naryth1ef/Remembers
[252] Pan, "The Knot Uses Facebook to Salvage 2,300 Weddings Disrupted by Hurricane Sandy."
[253] https://www.facebook.com/SandyReliefForWeddingPros
[254] Personal email with Willow Brugh, May 4, 2013.
[255] Cornell University, "Conference - Opportunities and Challenges of Participatory Digital Archives: Lessons from the March 11, 2011 Great Eastern Japan Disaster."

solve a growing number of the wide range of challenges that emerge following a crisis.

3.3.9 Donation Innovation

The focus of this case library is to illustrate the wide range of participatory aid that exists beyond the well-tread path of small donations, but recent years have seen tech-driven innovations in donation-making worth mentioning, particularly given the peer-to-peer nature of some of these examples. The examples break into two main categories:

Innovations in Donations to Traditional Aid Groups

The friction of making a donation has been reduced with ICT-powered fundraising campaigns. The Red Cross raised over $21 million for Haiti relief over SMS.[256] Donors simply texted 'Haiti' to the 90999 shortcode to give $10. The Red Cross also experimented with Amazon Payments[257] and donations via Chase ATMs.[258]

In the political realm, technology firm Blue State Digital built Quick Donate[259] for President Obama's 2012 campaign. The feature saved donors' payment information across devices and made subsequent donations a one-click process. It also allowed donors to contribute by SMS. Obama for America enrolled 1.5 million

[256] American Red Cross, “FAQ Mobile Giving.”
[257] https://payments.amazon.com/sdui/sdui/index.htm
[258] http://www.businesswire.com/news/home/20121106006507/en/Chase-ATMs-Accepting-Donations-American-Red-Cross
[259] http://rootscamp.neworganizing.com/awards/2012/mvt/entry/quick-donate-obama-for-america/

supporters in Quick Donate. These supporters gave four times more frequently and three times as much money as supporters without Quick Donate, totaling $115 million by the end of the campaign. These innovations reduce friction, but otherwise retain a relatively 'thin' participation role for members of the public who participate.

Community Donations

The rise of Kickstarter and similar crowdfunding platforms had inspired new avenues for aid money to flow directly to victims following crises. Following Hurricane Sandy, sites like HelpersUnite waived fees to encourage the public to donate to the storm's victims.[260] Story-driven fundraising campaigns on sites like Fundly[261] successfully raised over $25,000 for a family without flood insurance.[262] The SmallKnot[263] crowd investing platform waived fees to encourage donors to invest in locally-owned businesses following Sandy. Friends and family of some of the victims of the Boston Marathon bombings launched specific donation pages to raise funds for their loved ones' personal recoveries, in addition to the general One Fund administered by officials.

[260] http://www.helpersunite.com/
[261] http://fundly.com/
[262] http://venturebeat.com/2012/11/05/crowdfunding-disaster-donations/
[263] http://smallknot.com/about

4 Participatory Aid Marketplace

The case library highlights the wide spectrum of projects that channel the public's skill and desire to help in times of crisis. It also illustrates the fragmentation challenges that follow the arrival of participatory aid. My research and interviews established a strong need for a clearinghouse of participatory aid opportunities. I have built a website platform to aggregate such projects, improve coordination in this sometimes messy sector, and connect people who seek to give more than money with meaningful ways to contribute.

First, I investigate work that is either within the same 'technology for crisis response' field or functionally related to my goals (other socially-focused marketplaces and volunteer platforms). Then, I discuss the findings that inspire my intervention, including my design partners and the development of representative personas to guide the software design. These lessons directly inspired and inform the many technical decisions and features that comprise the Marketplace. Finally, I evaluate the Marketplace prototype in a survey and in iterative conversations with design partners.

4.1 Related Work

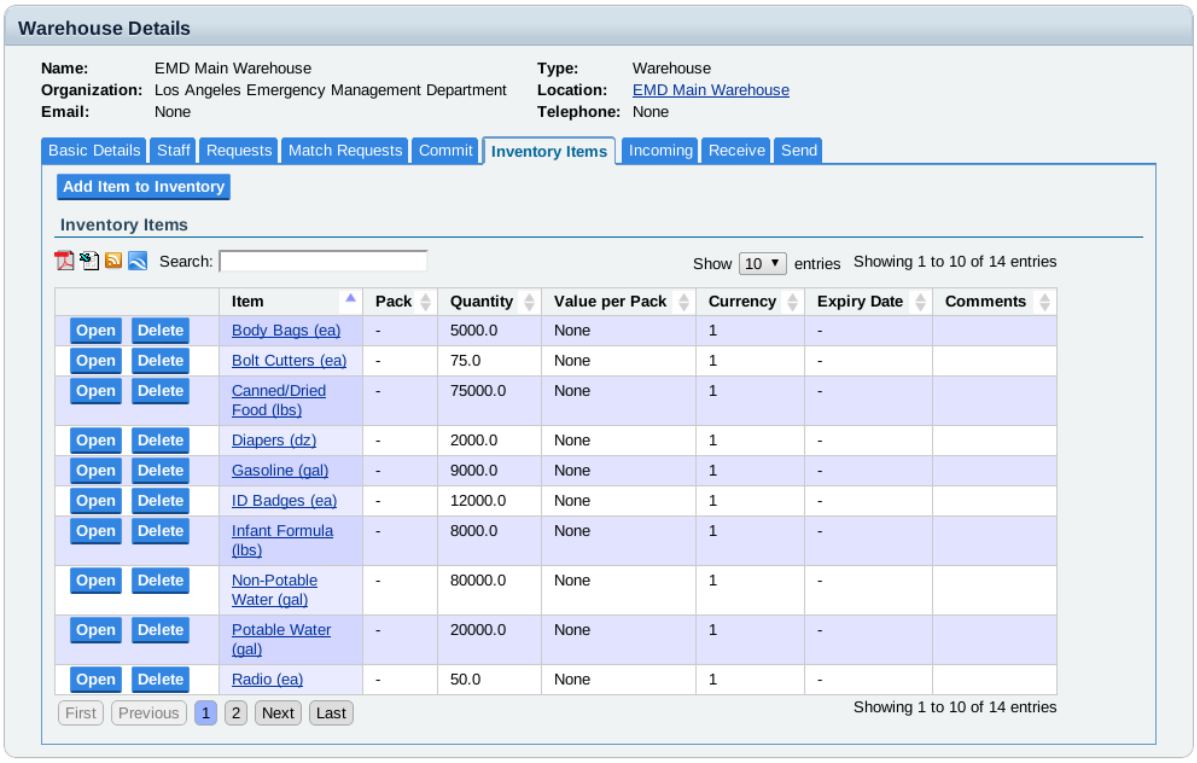
The case library provides a substantial overview of the growing number of online platforms that address crises. This section will discuss a more specific subset of related work to coordinate such technologically-mediated mutual aid responses.

4.1.1 Digital Coordination of Formal Aid

Significant progress has been made in recent years to improve the coordination of formal aid actors and resources with ICT. Major crises such as the earthquake in Haiti draw the involvement of thousands of NGOs, governments, and other actors seeking to help. Management of this wide array of actors is historically difficult, especially in the immediate aftermath of a disaster. One recent example is when US military took over control of Port-au-Prince's heavily congested airport from the imploding Haitian government in 2010, as planes arriving from around the world attempted to land with supplies for millions of people in need.

On a longer timeframe, information sharing of active and completed aid projects allows humanitarian agencies to better establish where needs are being met and where work needs to be done. Advanced filters allow project funders to sort by various criteria, such as crisis type and country, to identify troublesome gaps in response. There systems are often called '3W' or '4W' platforms. Such coordination platforms answer the questions, "who's doing what, where (and sometimes, when)?"

Figure 4.1: Sahana EDEN physical resource inventory



Sahana EDEN, profiled in the case library section, is a fantastic example of a 3W system. The software helps track and coordinate resources, like physical supplies, and the many organizations that might become involved in a given crisis. EDEN is an open source effort, but must be installed locally (it is not web-based).

EDEN is built by the Sahana Software Foundation, launched by "members of the Sri Lankan IT community who wanted to find a way to apply their talents towards helping their country recover in the immediate aftermath of the 2004 Indian Ocean earthquake and tsunami."[264] This early application of technical skill towards digital crisis management has benefitted numerous crisis response efforts since 2004.

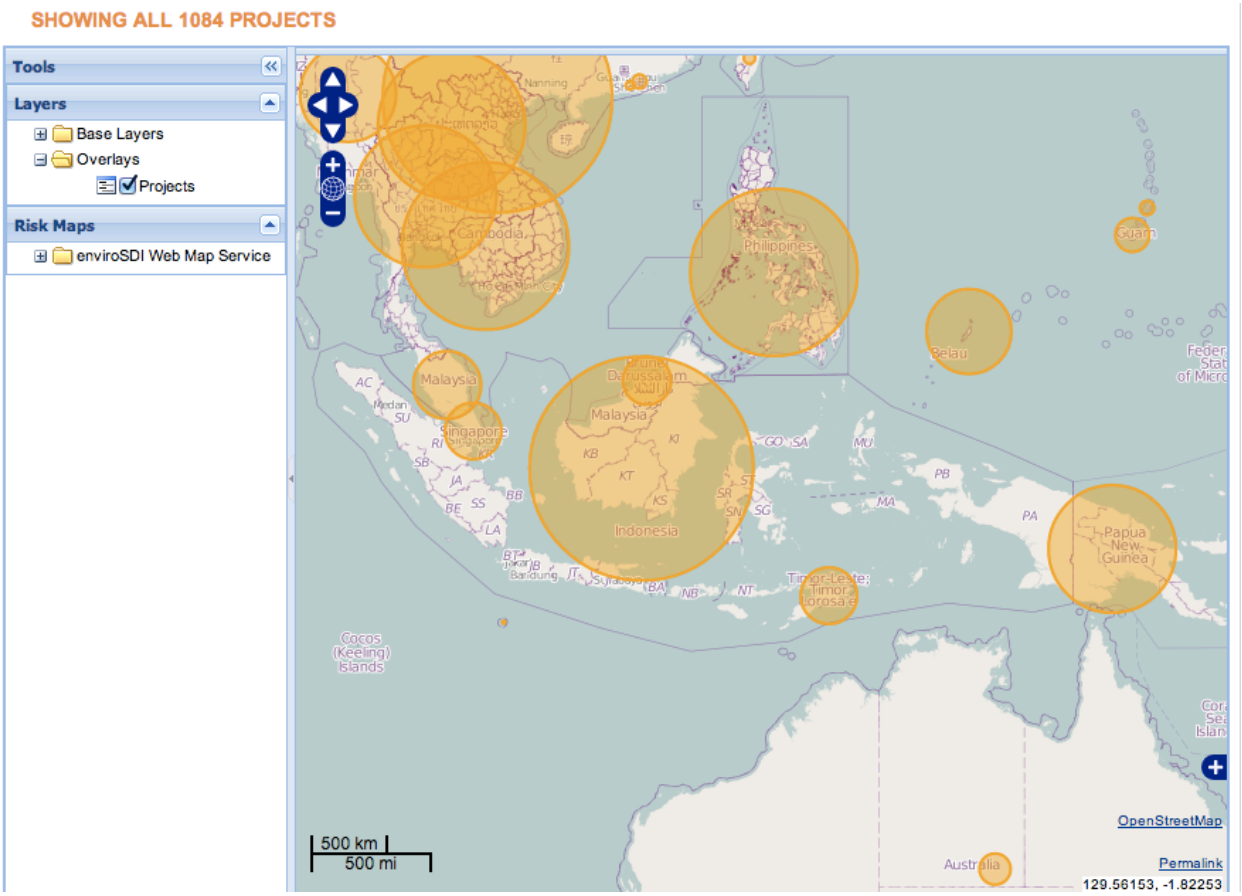
[264] Sahana Software Foundation, "History."

Figure 4.2: UNOCHA 3W

Another formal aid project portal is UNOCHA's global 3W map.[265] UNOCHA is charged with a mission fit for 3W systems: the coordination of humanitarian affairs. UNOCHA's 3W map displays pins at the geographic locations where OCHA has deployed. Each marker offers a quick list of links to contact directories and formal aid project matrices. The interface is limited to pins on a map, but it provides a useful geographic entry point to OCHA's work around the world.

[265] http://3w.unocha.org/WhoWhatWhere/

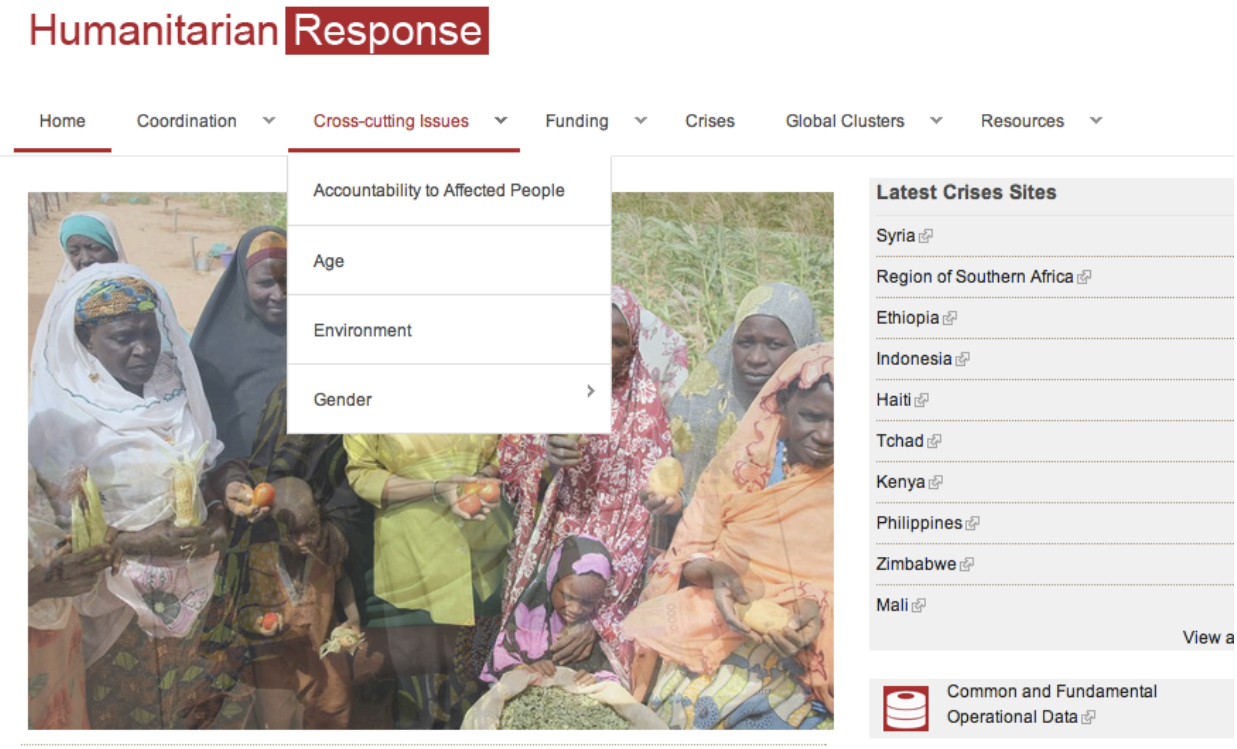
Figure 4.3: Disaster Risk Reduction Project Portal for Asia and the Pacific



Another UN effort is the Officer for Disaster Risk Reduction's (ISDR) Disaster Risk Reduction Project Portal for Asia and the Pacific.[266] It is similar to UNOCHA's 3W map as a portal to a humanitarian project inventory. The site is powered by Sahana Eden and tracks projects in their various stages of completion and allows formal actors to examine projects by various criteria and filters. One goal of the site is to help expose gaps in risk coverage by geography or subject to help funders make more informed decisions.

[266] http://www.drrprojects.net/drrp/drrpp/home

Figure 4.4: Humanitarian Response



Humanitarian Response[267] is a UNOCHA-run portal of active crises and the cross-cutting issues the UN manages. The site is well designed as a hub for formal actors, but the information within is clearly targeted at these users rather than ad hoc volunteers. For example, the site's primary navigation is organized around UN hierarchies, clusters, and priorities, rather than paths to action. Individuals interested in a specific crisis are sent to third-party sites that vary significantly in terms of structure and content, and especially engagement opportunities.

[267] http://HumanitarianResponse.info

4.1.2 Volunteer Platforms

In addition to response coordination platforms, there are many volunteer project websites that overlap with the Marketplace in their desire to help well-meaning volunteers find relevant, meaningful ways to contribute their time. Examples include VolunteerMatch, Idealist, AllforGood, and countless others. I have followed this space for many years in my previous life consulting grassroots organizations. Volunteer opportunity websites represent a significantly more mature sector than many participatory aid efforts, and these platforms offer valuable learnings for connecting users to projects. Some of the more advanced online volunteering platforms are well designed, with years of experience in the space, and could theoretically provide crisis-specific volunteering sections if they were able to ensure that new participatory aid projects would be listed in their system in a timely manner.

There are clear differences, however, as these portals generally assume users are seeking civic engagement rather than to aid in a crisis. These websites are also guilty of overwhelming users with too many options, despite the many filters available. They offer too many projects with too little curation, and some, but not all, clearly communicate how they will make use of a volunteer's specific skills. As administrators field thousands of volunteer opportunities over time, they expand their systems and search tools to add more and more features and fields, overwhelming users.

Figure 4.5: Online volunteer sites suffer from the 'community bulletin board' effect

Generally, traditional online volunteering platforms offer little sense of acute need felt in time of crisis, or momentum expressed by the social gathering we see as volunteers join many successful V&TC projects. The Participatory Aid Marketplace intentionally targets a more narrow scope of the potential volunteering universe. The

goal is to promote participatory aid projects and drive relevant candidates to these projects in the most organized way possible, without inhibiting user action with superfluous decisions or unrelated resources.

4.1.3 Inventory of Participatory Aid Projects

When we limit our selection to volunteer platforms designed to connect users to online projects in the context of a crisis, the pool becomes much smaller. Recovers.org and New York Tech Responds each established volunteer intake systems, but it was other operational volunteers who manually completed the actual matching of volunteers to opportunities.

In addition to connecting volunteers to active projects, the Marketplace also seeks to inventory a case library of participatory aid projects to broaden the collective imagination of what can be done to help in times of crisis. Previous incarnations of participatory aid project catalogs have included wikis, Google Spreadsheets, and marketplaces for related sectors, such as civic engagement.

Historically, Crisis Commons maintained a MediaWiki installation documenting participatory aid projects and tools, but it has been offline for months.[268] Wikis suffer from high barriers to participation, as new users must register and learn wiki syntax to participate. The informal structure of wikis, as collections of documents, require constant pruning.

Google Spreadsheets often serve the immediate need of tracking who's doing what, where, online in a time of crisis. They also provide very low barriers to participation.

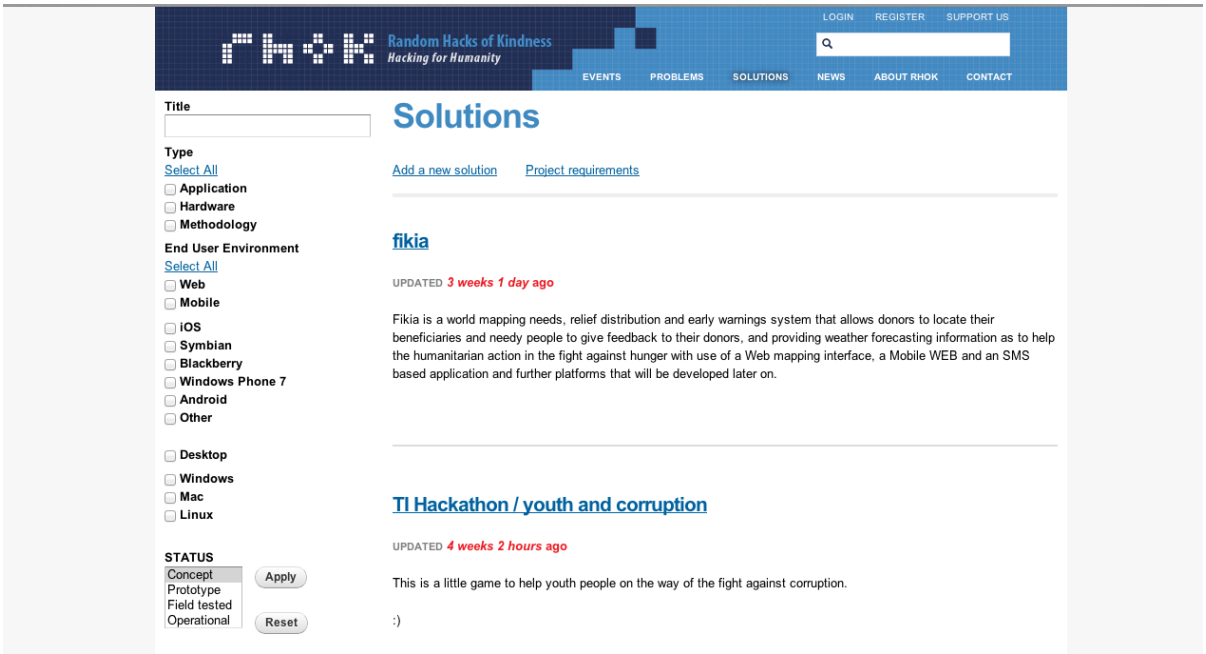
[268] http://wiki.crisiscommons.org/

There were several competing spreadsheets during the Hurricane Sandy response, and New York Tech Responds did an excellent job maintaining (and pruning) a crowdsourced list of participatory aid projects. These spreadsheets are rarely used between multiple crises, so historic knowledge of previous work is siloed.
The participatory aid space is mature enough to populate a website that spans multiple crises and invites contributions while offering structured content types to bring order to the listings.

Code for America is currently developing a Commons platform to aggregate various civic apps. This platform is targeted primarily at municipalities and open government projects rather than participatory aid responses, but we expect to monitor its development closely for shared opportunities, as both the Commons and the Marketplace have been developed on Drupal. As an open source platform, development of new functionality can be easily shared between projects. The advent of Drupal Features allows custom configurations of existing functionalities to be exported and imported, as well.

Another platform under development is the Humanitarian Toolbox. This platform provides a home for participatory aid software projects between hackathons, and helps recruit help from other software developers. It may include an API or similar data sharing effort to allow the Marketplace to point users to the technical repositories of various projects.

Figure 4.6: Random Hacks of Kindness Solutions Database



The Random Hacks of Kindness website which maintains a Solutions catalog tracking the technical projects that emerge from their crisis hackathons. This differs from the Marketplace in that entries range from untested concepts to prototypes and operational products. Listings are code-focused, so opportunities to contribute are likely limited to software developers, but again, data sharing efforts could help unite these collections. These projects are also focused on preparation of tools and code, rather than response projects.

Lastly, the CrowdGlobe[269] project by Internews is a related effort to research ICT projects like crisis maps. The platform is designed primarily to share research, not drive volunteers.

[269] http://crowdglobe.net/

The Participatory Aid Marketplace differs from the Related Work by combining these three elements: project coordination, volunteer opportunities, and historical inventory. It accomplishes each of these three goals while eliminating much of the distracting extraneous content often found in each category.

4.2 Design Method

Pulling from principles in co-design and anthropology, I embedded myself within the V&TC community I wish to support with this work. Interviews established that an influx of volunteers could be relied upon following media attention, so I focused my efforts on the supply side of participatory aid. Any effort to aggregate projects and coordinate efforts would require the platform be of utility to these actors, so I observed them in a wide variety of discussion forums.

4.2.1 Partner selection

My approach to collaborative design has been to start with a small group of key partners to iterate with quickly, but also to reach out to a larger network, via survey, to innovate on a longer cycle. Collaborative platforms like the Marketplace must be built within the existing ecosystem and cognizant of others in the space; building in isolation is a recipe for non-adoption. The long process of researching the case library informed a strong understanding of the many actors in the formal, participatory, and related aid sectors.

As I began to understand the full spectrum of crisis responders, from ad hoc volunteers to multinational institutions, it became clear that V&TCs are ideally situated

on this spectrum. The groups are relatively agile and fluid, but have proven more sustainable than many short-term hackathon projects, and have implemented basic organizational processes like volunteer codes of conduct and rationales to determine deployment decisions. Most importantly, the buy-in of these groups could help ensure usage and eventual contribution to the platform.

Before building anything new, I read the written works of, conducted interviews with, emailed, and spoke informally with a wide range of leaders in the participatory and formal aid spaces. These include:

- Shoreh Elhami, GISCorps
- Luis Capelo, Digital Humanitarians Network
- Natalie Chang, Digital Humanitarians Network
- Patrick Meier, Standby Task Force
- Caitria O'Neill, Recovers.org
- Willow Brugh, Geeks Without Bounds
- Cathy Furlong, Statistics Without Borders
- John Crowley, Humanitarian OpenStreetMap
- Pascal Schuback, CrisisCommons
- Noel Hidalgo, New York Tech Responds
- Andrej Verity, UNOCHA
- Wendy Harman, American Red Cross
- Cat Graham, Humanity Road
- Kate Starbird, University of Washington
- Brian Forde, White House
- Robert Baker, Ushahidi
- Ryan Cohen and Alethea Hannemann, Taproot Foundation
- Ryan Julison, publicist for Trayvon Martin
- Max Slavkin, Creative Action Network

- Andrew Turner, ESRI

The ability to interoperate with related efforts such as the Humanitarian Toolbox, Humanitarian Exchange Language, and Management of a Crisis namespace were important early considerations. In addition to the in-depth study of the creative humanitarian space, I pulled from a deep background in participatory politics, participatory media, and consumer web products for inspiration.

4.2.2 Partner-Driven Evaluation

From the onset, my goals for this work have been to support behavior change generally, by promoting participatory aid projects, and specifically, by facilitating meaningful volunteer action. The results of this thesis will be evaluated by the perceived utility of the prototype to solve the coordination issues it takes on, as measured by an anonymous survey distributed to participatory aid actors and ongoing interviews with leaders of V&TC organizations.

The topic matter of this research (major crises) dictated that I not experiment with live interventions with real lives at stake. For these reasons, I chose to co-design for a core group of partners with regular feedback and iterations. The findings provided by interviews with partners directly informed the design decisions made (as detailed in Supportive Technical Design Decisions).

In addition to these core design partners, I conducted an online survey of the proposal, to be discussed in the Evaluation section. The survey's primary purpose is to determine if members of the public, especially those who are civically engaged, feel they have skills to contribute over the web in times of crisis. I also used the survey itself

as a vehicle to spread awareness of the platform itself. This proved advantageous as a number of relevant contacts soon got in touch for further discussions.

4.2.3 Persona-Driven Design

From the interviews, I came to an understanding of the fluctuating aid landscape described throughout this thesis. A stratification of actors emerged, and in describing these, I landed on the primary personas that would inform the site's development. Persona-driven design, pioneered by interaction designer Alan Cooper,[270] is an established method in software development that asks designers to think deeply about the various classes of actual people who will use the software and their goals, rather than individual tasks or features. By consistently channeling these archetypes, designers can make each individual decision with that person's needs, goals, and behaviors in mind.[271] I designed with a persona in mind for each level in the stratification of participatory aid.

Primary personas:

1. Unaffiliated volunteers
2. Project leads (V&TC or unaffiliated)

Secondary personas:

3. V&TC coordinators
4. Formal aid actors

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[270]

[271] Cooper and Reimann, *About Face 2.0: The Essentials of Interaction Design*.

In keeping with persona-driven design, I've designed unique Views for each of the primary personas. These interfaces are then influenced, but not dominated, by the needs of the secondary personas. You'll notice that we are not trying to solve for the affected population, unless they are project leads themselves (as some were in aftermath of Hurricane Sandy).

Unaffiliated Volunteers

"The people formerly known as the donors", with apologies to Jay Rosen,[272] are one of the two primary marketplace audiences. This is not the general public, but rather an engaged, empathetic subset seeking meaningful ways to contribute to those in need. The general consensus in the aid space is that the motivation of these potential volunteers is driven by media attention to a crisis, and can dissipate as media attention fades. Given this temporal sensitivity, any system designed to harness the goodwill and outreach of this audience must be able to handle a short surge of attention in the wake of a crisis (or as soon as the news reaches a broad audience). If efficiently harnessed, this incoming wave of volunteers can offer a range and depth of skillsets and professional experience that would be impossible to retain full-time in crisis organizations between disasters.[273] But these ad hoc volunteers are also unlikely to be trained in or otherwise familiar with the protocols of aid groups, be they participatory or formal. Their desire is to minimize transaction costs while identifying an effective way to contribute to relief efforts. Volunteers have their own set of needs,

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[272] Rosen, "The People Formerly Known as the Audience."
[273] Blanchard, Heather. Personal interview. March 29, 2013.

ranging from limited time, desire to have impact, and the sense of fulfillment and actualization they wish to experience. Volunteers' sense of self-agency in approaching or beginning relief projects can vary wildly.

Unaffiliated Volunteer Scenario

1. An ad hoc volunteer learns about the crisis on social media a day after it occurs, and clicks on a link to a blog listing ways to help. The blog links to the specific crisis page on the Marketplace site, as countless websites linked to Recovers.org's Volunteer form in the weeks following Hurricane Sandy. The volunteer arrives at the site and immediately sees a grid of 7 projects which are a) active and b) actively seeking volunteers. The project cards show a condensed summary of what the project seeks to do to help and icons identifying the three broad skillsets the project's administrators seek in volunteers. The volunteer clicks the "More info" link on a couple of projects before clicking the "Join" button on a crowdsourced data collection effort. The volunteer is brought directly to the intake process for that effort without ever registering on the Marketplace site.

2. A software developer scans the news all day and learns of the crisis within hours of its start. The developer follows the relevant hashtag on Twitter, where the developer sees a link to one of the several platforms tracking needs and response efforts. The developer goes to the Marketplace and, seeing only a list of donation links and established needs, browses former projects responding to the same needs. Seeing a growing number of messages looking for individual loved ones, the developer deploys Google's Person Finder application and adds the project to the listings in the

Marketplace. The developer toggles the ‘seeking volunteers’ option ON, and identifies ‘software development’ and ‘get the message out’ as the desired skills.

3. An NGO employee working to bring alleviation to people affected by a months-long drought brainstorms tactics to bring attention to the plight of the affected population. The employee comes across the case library of projects, and, seeing an icon for “Get the message out”, clicks, and explores a range of media-driving tactics that make use of existing contacts in his network.

Project Lead

The Project Lead wants their work listed among other response efforts, be it an application, a map, or another participatory aid effort. They would like the option to edit the content on their project’s page in such a listing. Project leads may or may not want additional volunteers for their project. They may want large numbers of volunteers, if they are designing a crowdsourced project, or a project that requires a substantial number of people to be aware of its existence (like a shelter map). Or, they may need a few very specific skillsets to help move their project forward. Project leads who belong to V&TC groups want an easy way to check-in to a crisis and announce their involvement in as few places as possible while reaching as many peer actors as possible.

V&TC Coordinator

The V&TC Coordinator has seen a number of projects fail, and is a bit jaded by inevitable duplication in the participatory aid space. The Coordinator helps new actors connect to existing efforts, and uses the Twitter contact information on the Project

listing to get in touch with the person behind a nascent project and convince them to combine their efforts with a more established group setting up a similar crisis map. The Coordinator posts their group's deployments on the site, where it is automatically sent out to the rest of the V&TC network, but also toggles the project page to not accept new volunteers, preventing the project from showing up in the listings incoming volunteers see.

Formal Aid Actor

A UN official would like to get a better sense of who's doing what, where, in the online space to mirror situational awareness on the ground. She would also like to connect resources to the relatively few groups doing effective work on the ground. Lastly, she wants to measure the range and depth of these projects afterwards, but doesn't want to spend all day refreshing the pages. She produces a search with the parameters she desires (filtering for the current crisis) and subscribes to the specific RSS feed for those results. This feed populates the existing information management system her team uses.

Impediments to Volunteer Action

The goals of the Marketplace, to support and create behavior change in online aid coordination, required consideration of the impediments to user action.

1. Awareness

Volunteers must understand and believe that they are capable of contributing to help. Clearly, this is not always true, but the rise in participatory aid suggests that the

likelihood talented volunteers have something to contribute has increased. The Marketplace's highlighted Projects, past and present, seek to answer the common question of "How can I help?", and enable yet more solutions by clearly signaling established needs.

2. Motivation

Even if aware, volunteers must be motivated to get involved. We have designed the Marketplace around specific time-bound crises to reflect the motivation of specific events in driving volunteer action. The Marketplace's treatment of Projects and Crises is incredibly time-sensitive compared to Related Work in the general, ongoing volunteer sector. Barriers to motivation, such as the lack of clear direction for involvement, are removed by the Marketplace's active listings.

3. Enablement

If a volunteer is aware and motivated, the critical factors for success are:

Ensure a selection of projects is available when the volunteer searches.

In addition to recruiting volunteers to help list projects that exist organically, we aim to direct users to donation-based and related efforts if the population of volunteer projects is lacking.

Ensure there is not an overwhelming selection of projects in front of the volunteer.

Only active projects actively accepting volunteers will be presented to users. Projects will be filtered to match users' skillsets whenever the data exists to perform this matching function.

At this stage, we are focused on designing to allow for additional adjustments by the chosen user personas. The decision not to over-develop the software before iteration driven by user feedback was considered a feature rather than a bug.
I worked at all levels of the emerging participatory aid space, from the most flimsy creative ideas to the most formal, storied United Nations programs. My work has been to bridge this gap in a way that respects the strengths and drawbacks of each approach.

Given the state of flux this space is in, and will continue to be in for years to come, I chose to "design for messy." The great value of participatory aid is not simply the engagement of more people, although that matters in a time of limited formal resources, but also the creative emergence that is possible if it is not suffocated.
A critical priority for the development of the software's user interface is that it be "low-threshold, high-ceiling." Resnick, et al, describe this design philosophy in the context of user interfaces for creative thinking:

> Effective tool designs should make it easy for novices to get started (low threshold) but also possible for experts to work on increasingly sophisticated projects (high ceiling).[274] The low threshold means that the interface should not be intimidating, and should give users immediate confidence that they can succeed. The high ceiling means that the tools are powerful and can create sophisticated, complete solutions.
>
> Resnick, et al[275]

This philosophy is manifested throughout the platform. The homepage and other Views designed for unaffiliated volunteers are basic, but beneath this surface layer lie a

[274] Myers, Hudson, and Pausch, "Past, Present and Future of User Interface Software Tools."
[275] Resnick et al., "Design Principles for Tools to Support Creative Thinking."

variety of powerful technologies to facilitate a super user's search, aggregation, and data exporting needs. By maintaining low thresholds that allow many participants, but also high ceilings that invite deep participation, we can support both worlds.

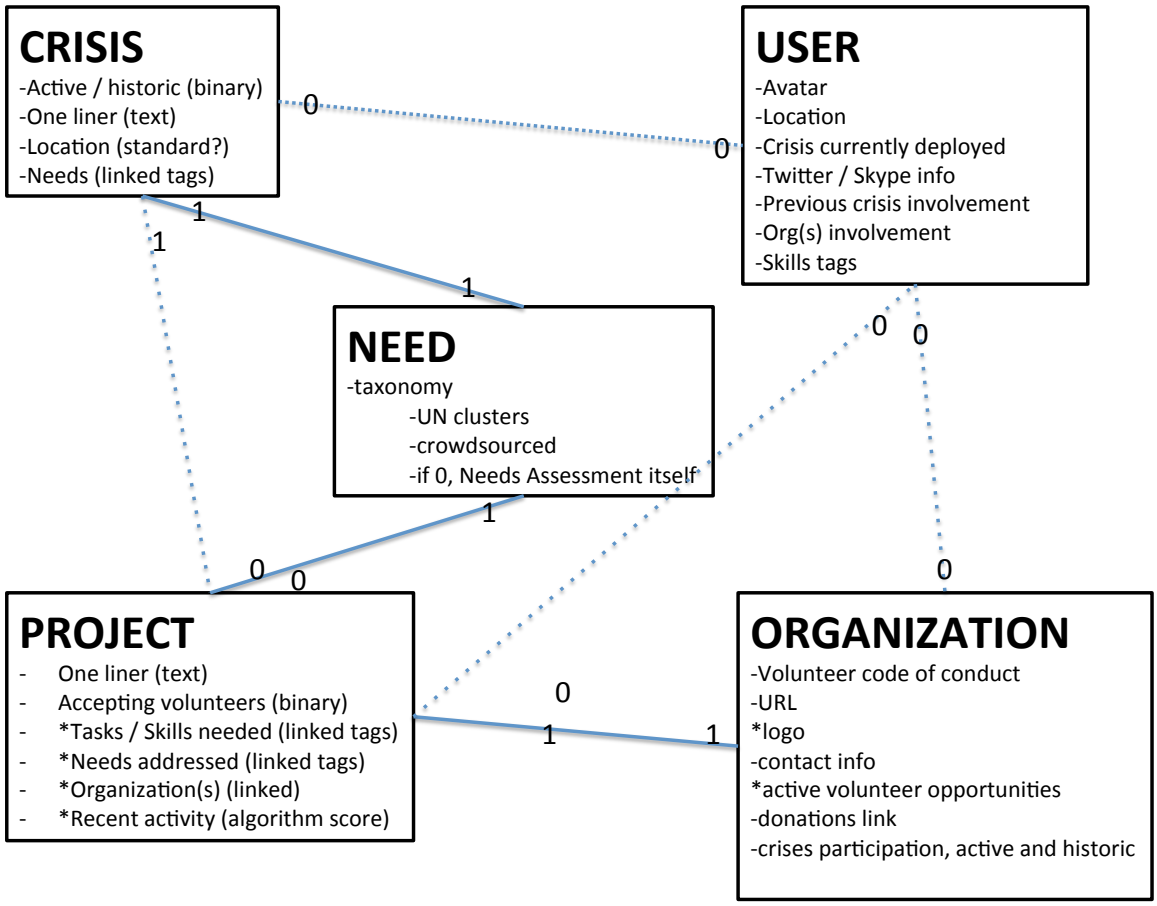
4.3 Platform Selection

I began the software development process agnostic to the myriad software languages available. Before even recruiting a team, I consulted with technical advisors and humanitarian allies to establish how to best support the project's goals. After a period of exploration, it became quite clear that Drupal offered the most flexibility and strongest support for facilitating coordination possible. In this section I will outline some of the deciding rationale behind this choice.

4.3.1 Relational Entities

Core to the achievement of the Marketplace's goals is the ability to interlink participatory aid Projects, the Organizations that run them, the Users (Volunteers) that seek to join Projects, the Skills Volunteers offer, and the Crises that inspire this action. The Content Management System (CMS) must allow regular users to interact with easily understood nouns (Project, Organization, Crisis). These entities are interlinked by Drupal, and we can modify and expose these connections wherever it proves useful. To organize the architecture of these entities, I designed a relational entity map that visualizes the database relationships, as well as the direction and number of links:

Figure 4.7: Relational Entity Map organizing the Marketplace's content types



Most content types on the site can be linked to zero, one, or multiple instances of other entities. For example, Users can list one or more Crises in their profiles, but do not need to. Projects, meanwhile, must belong to one specific Crisis.

The backend of the Marketplace code can easily be configured (and modified) to support any standardized naming schema that gains traction in the aid sector. This allows us to design for people not familiar with the many byzantine acronyms of aid agencies while still respecting the data structures and processes of these groups.

4.3.2 Open Source

An open source platform brings with it a number of benefits other than ideological superiority over closed systems. The community's development of commonly desired features greatly reduces the need for original software development. By identifying, evaluating, and configuring existing Drupal modules, we avoided reinventing the wheel and instead focused our efforts on fitting the elements to best meet our personas' needs.

4.3.3 Portability

Drupal is also eminently modular. The modules themselves can be individually toggled, configured, and shared. The addition of Features allows specific site configurations to be exported, in addition to the code itself.

Beyond its general prevalence across major sites like WhiteHouse.gov, there has also been significant progress in the development of similar marketplace applications with Drupal. UNOCHA's HumanitarianResponse.info website has been developed in Drupal, as has Code for America's Commons website, which aggregates civic apps for municipal users.[276] Although there are significant differences between the Participatory Aid Marketplace and these sites, we were able to consult the work done (and modules chosen) by these teams to quickly navigate the wide range of Drupal options. Individual site elements or groups of functionality could be relatively easily

[276] http://commons.codeforamerica.org

shared with others in the humanitarian space or elsewhere, and we could likewise benefit from continued development undertaken by our peers.

4.3.4 Open Data Formats

An important consideration governing the choice of technical platform is support for emerging open data standards in the humanitarian space. A seemingly-endless stream of conference panels and blog posts praise the benefits of open data, but actually achieving open standards in a sector with major barriers (technical and cultural) to interoperability is not so easily achieved. Achieving open data interoperability in the humanitarian sector is a significant challenge beyond the scope of this thesis, because it will require significant negotiating and existing formal aid relationships.

One of the biggest challenges to implementing open data is replacing outdated but core legacy information systems within formal aid institutions. As a new effort, my work to aggregate participatory aid projects can support open data efforts from the beginning to the extent that they gain significant adoption. I ruled out several promising web platforms and languages on the grounds that their database structures impede seamless sharing of data with other actors.

Proprietary tech platforms offer similar hurdles. Even in the best-case scenario, where a proprietary system allows interoperability into and out of the database, organizations are left to rely on the continued goodwill (and commercial existence) of these private entities to maintain these inputs and outputs. It is far more advisable to design with truly open standards from the onset. These considerations further

supported the choice of Drupal, given its native support of two new efforts in humanitarian open data. Open data formats also allow aid agencies and institutions to integrate any Projects, Organizations, and even Skills and Needs into their legacy systems.

One example of the importance of open data is the claim by Rachel Haot, Chief Digital Officer for the City of New York, stating that the government was able to serve and inform ten times as many people by embracing an open strategy in the aftermath of Hurricane Sandy.[277] They did this by sharing up-to-the-minute flooding projections, shelter locations, and food distribution centers in open formats that could then power third party emergency maps and applications. The city also communicated information on transparent social media platforms to distribute information widely and in real-time.

Management Of A Crisis XML Namespace

As noted previously, Drupal allows us to provide user-friendly names on the frontend while supporting open data initiatives with shared naming schemes on the backend. We have built in early support for the Management Of A Crisis (MOAC) XML namespace. This shared, standardized naming scheme is basically an agreement between different database administrators to name entities the same way so as to facilitate translation of data between disparate sites. The organizing group explains the inspiration, need, and process of developing the shared namespace:

> *MOAC…is a lightweight vocabulary aiming to provide terms to enable practitioners to relate different "things" in crisis management activities together as Linked Data. The initial MOAC terms*

[277] Haot, “Open Government Initiatives Helped New Yorkers Stay Connected During Hurricane Sandy.”

> *originated from the Inter Agency Standing Committee (IASC), Emergency Shelter Cluster in Haiti, UNOCHA 3W Who What Where Contact Database and Ushahidi platform. Efforts have been made to involve a number of international humanitarian and crowdsourcing volunteering communities to authenticate MOAC usability, functionality and structures…Today, most data from humanitarian agencies are in the form of spreadsheets, PDFs and word processor documents hidden somewhere in a desktop or a server. A number of agencies are making gradual efforts to publish these data as an open source. However, during the period of the development of this platform, it is noted that there are no suitable disaster management vocabularies with well-defined URI (Uniform Resource Identifier) and RDFs (Resource Description Framework)…One of the primary goals of the MOAC is to link crisis information from three different sources: a) traditional humanitarian agencies (shelter cluster), b) Volunteer and technical committees (Ushahidi Platform) and c) disaster affected communities.*
>
> Management of a Crisis Vocabulary Specification[278]

After a thorough review of the MOAC namespace for overlapping concepts, we have added MOAC fields to relevant entities, such as Crisis Needs (e.g. Shelter). As the MOAC namespace gains wider adoption, we will be able to support using the same machine-readable entity names.

Humanitarian Exchange Language (HXL)

Interoperable systems do not necessarily require uniform parts.[279] Another exciting development in the open humanitarian data space is HXL. This exchange language is supported by UNOCHA in its efforts to better coordinate humanitarian actors. Many institutional actors have legacy systems in place, so rather than attempt

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[278] "Management of a Crisis (MOAC) Vocabulary Specification."
[279] Palfrey and Gasser, *Interop: The Promise and Perils of Highly Interconnected Systems*, p48.

to agree upon a shared namespace, HXL allows disparate structures to talk to one another by essentially translating between the systems (rather than using the same language, as an XML namespace encourages). This allows legacy systems to remain in place while opening new potential to return results from multiple systems to a single query.

The ability to support HXL was another important factor in choosing Drupal as a platform for the Participatory Aid Marketplace. Drupal 7 now supports Resource Description Frameworks (RDF) as a core feature. This allows Drupal content to be published or queried by SparQL (an offshoot of SQL) in ways that support linked (semantic) data. Drupal's RDF support is another area where active community development will continue to improve the extent of its interoperability. See, for example, the D2.0 project under development to extend Drupal's RDFx module.[280]

In addition to these explicit open data efforts, Drupal natively supports powerful, extraordinarily configurable content syndication with many custom RSS feeds available to administrators and users alike. These feeds enable endless additional options for sharing of data across different groups and actors.

4.4 Technical Implementation

The majority of the development time has been spent implementing and configuring solutions to meet the goals of our personas and facilitate participatory aid.

[280] Shah, "Hackathon for Disaster Response 2.0."

System architecture

Drupal itself sits atop a stack of PHP, Apache, and an Ubuntu server. Drupal organizes the database, which populates Panels comprised of Views. Panels are essentially dashboards that pull together various elements into a comprehensive screen for different users. A Panel might offer an image and description of a Crisis, followed by a number of Project cards below, and a list of active organizations in the right margin. Each of these sections is a block, and the logic populating this block with content is called a View. Each View can syndicate the filtered content not only as blocks, but also as standalone pages or machine-readable feeds. Modules offer additional configurations and functionalities as expressed in PHP.

The Marketplace is designed as a white-label product which could be easily adopted, in part or in full, by existing organizations and sites, or supported as a standalone platform. For the purposes of this prototype, we borrow the clean visual theme of UNOCHA's HumanitarianResponse.info platform. The site's long-term aesthetics should be determined by its organizational home and empirical testing of design assumptions, but the core formats and templates, such as Project cards, are in place.

4.5 Supportive Technical Design Decisions

Throughout the design and development process, existing processes and behaviors in the participatory aid space have directly informed technology decisions. Some of these processes are codified, others are not, and many are still evolving as

participatory aid itself evolves (including the processes of V&TCs, most notably). Between the core personas and existing practices, numerous individual design and technical decisions were implemented to support these actors.

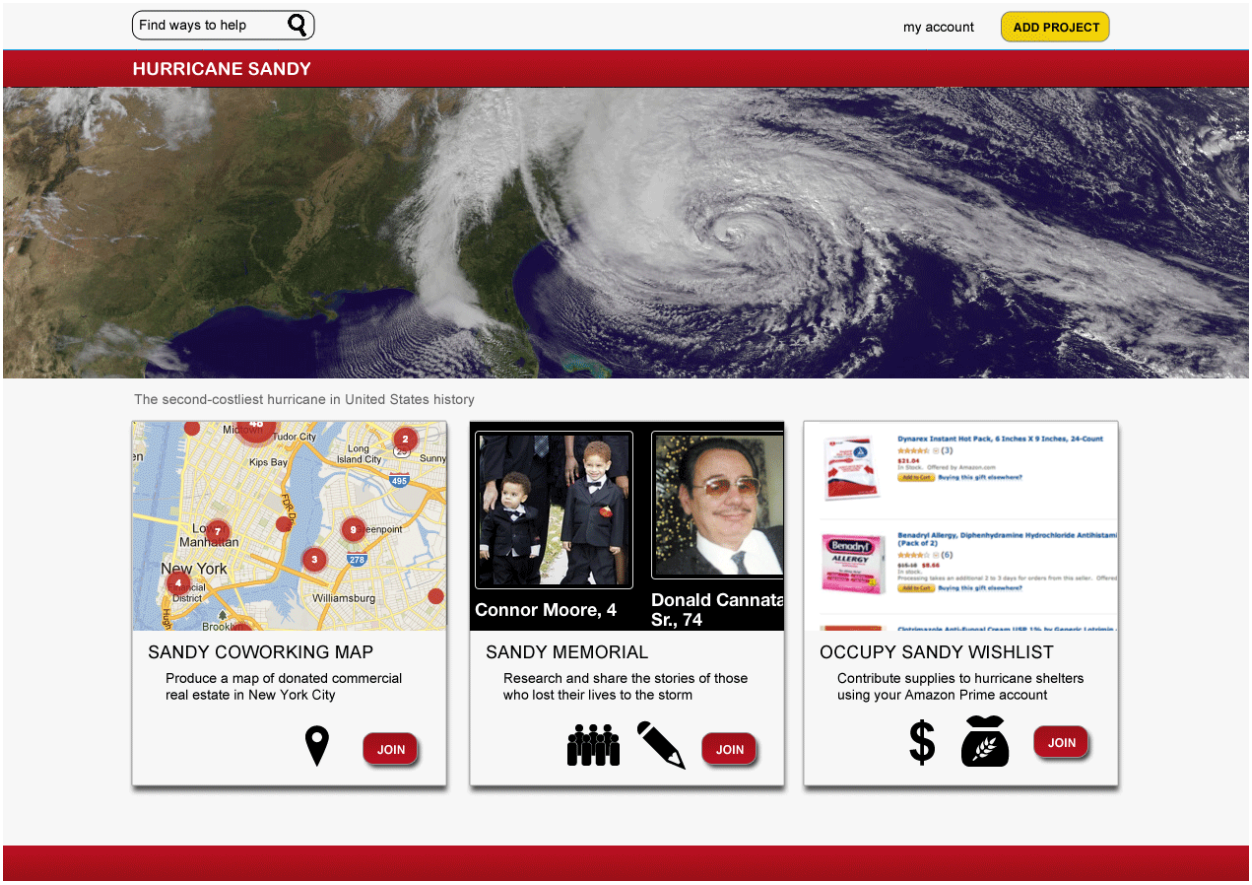
4.5.1 Unaffiliated Volunteers

For potential volunteers seeking ways to help, I designed with Herbert A. Simon's appreciation for attention scarcity, rather than information scarcity. The related works discussed are useful information portals for institutional actors in their comprehensiveness, but the sites provide an overwhelming amount of non-actionable information to the end user. We can instead remove information to better meets users' needs and goals.

Homepage

To simplify the array of options with a bias towards volunteers taking action, the default homepage of the site lists only active crises, and active participatory aid projects actively seeking additional volunteers or resources.

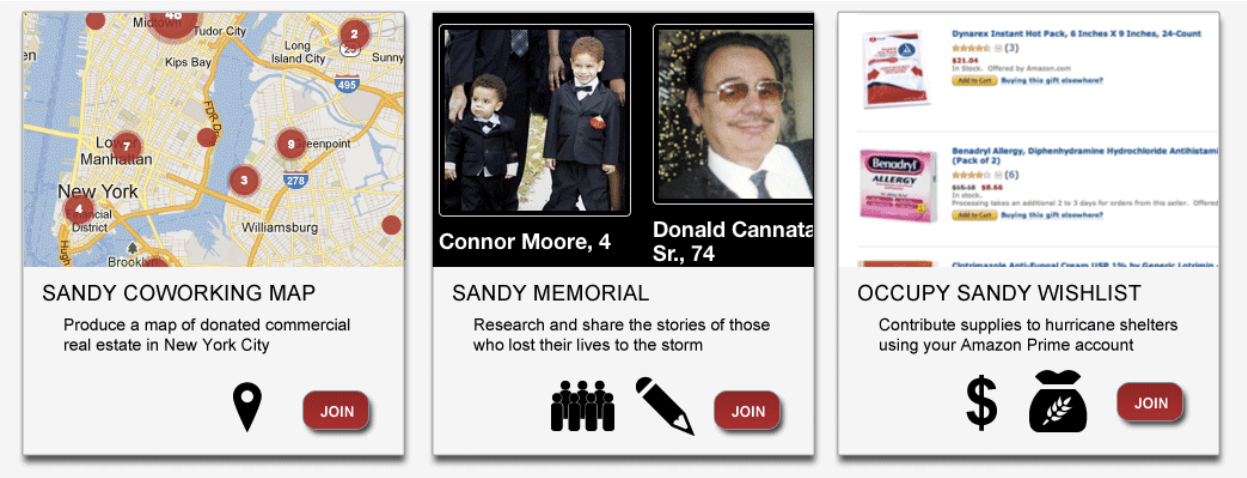
Figure 4.8: Illustrated wireframe of the Marketplace homepage



A condensed view of each Project is displayed in a 'card' format inspired by recent design directions at Twitter[281] and Google.[282] The format allows the potential volunteer to view the most pertinent information while retaining the ability to present multiple options without delivering overwhelming amounts of text or other information.

[281] Twitter, "Get More from 140 Characters with Twitter Cards."
[282] Google, "Google Now."

Figure 4.9: Sample Project cards present actionable information



Each card displays a condensed, graphically-oriented view of a participatory aid Project and its most actionable information:

- Thumbnail Project image or screenshot
- Project title
- A one-sentence description of the Project's objective(s)
- Icons of the Skillsets the Project seeks from Volunteers
- An action button that leads directly to the Project's native signup or coordination page
- A "More information" link for users who wish to explore more information about the Project on its full page

The list of crises on the homepage is editorially selected and prioritized, but the Drupal View is designed to support any number of active crises. In addition to the homepage, each crisis receives its own subdomain for a complete dashboard of related activity.

Minimal User Registration and Open Permission Levels

The first step in respecting the unaffiliated volunteer's needs is to limit the adverse effects of user registration however possible. The most obvious remedy for registration fatigue is to eliminate the need to register wherever possible. Whereas V&TC sites Digital Humanitarians Network and Standby Task Force require registration on the commercial Ning.com platform before visitors can access crisis-related content, we've configured Drupal's user permissions to allow a far more flexible, frictionless anonymous user experience. The majority of the actions the unaffiliated volunteer may want to take in the marketplace can be achieved without registering or logging in. This includes viewing the needs of a crisis, searching for and exploring in-depth the range of existing projects, and connecting directly with ongoing participatory aid projects.

To meet our goal of connecting potential volunteers with actively-recruiting projects with the least friction possible (low thresholds to participation), we do not erect the hurdle of collecting user information before the user can engage with a project. Part of the rationale for this decision is that the recruiting projects and organizations themselves often maintain a proprietary volunteer intake system, constituent relationship management software, or other intake pipeline that supports their needs. We do not wish to duplicate or supersede these efforts, so we deliver users directly to the first step of these intake experiences. The user can easily navigate directly to projects from our homepage, by clicking the "Join" buttons on Project cards. Using Google Analytics, we can track outbound links and, for the class of users who click them, consider a small amount of time spent on our site a very healthy metric. At the same time, we provide high ceilings to users who do wish to create full

profiles on the site (high ceilings). We have developed the ability for users to quickly populate their Marketplace profiles with their professional LinkedIn experience (discussed further in the Skills section, below).

Higher-level actions, such as adding a project to the Marketplace, could require site registration, but we are experimenting with a combination of wiki-style editing privileges. We have configured modules to support time-tested methods of moderating user-generated content: peer flagging of malicious content and CAPTCHA systems to prevent bots. We could even allow anonymous users to submit or edit Project content. A moderation queue allows moderators to approve or reject contributions from Anonymous users while letting trusted users contribute directly. “Trusted users” could include all registered users with confirmed email addresses, or a smaller subset, such as members of the Digital Humanitarian Network, depending on site usage. Additional modules facilitate the moderation process for administrators. The Diff module provides an instant, visual comparison of a document before and after editing. The CAPTCHA module not only prevents spambots, but also inserts an additional time barrier to human users trying to add large amounts of low quality information or edits.

Third Party Login Systems

Mozilla’s Personas system supports admirable ideological goals for an open web, but has not reached widespread adoption to warrant it being the sole site login system, as it is on HumanitarianResonse.info. At this point in time, the average user’s experience understanding and proceeding through the Personas registration process introduces unnecessary friction to the user to support the ideological goals of the

administrators. If our goal is to serve unaffiliated volunteers, the far more popular Facebook Connect login option is preferable. As of December 2010, over 250 million mainstream users per month use Facebook Connect to register and log in on third party sites.[283] As of mid-2012, 49.3% of the top 10,000 websites in the world have some degree of Facebook integration on their homepages.[284] To provide the most frictionless user experience possible, the Marketplace supports two-click Facebook Connect found throughout the web. Users who don't wish to use their Facebook accounts, or who do not have Facebook accounts, have the option of Drupal's standard email-and-password-based registration and login system, which mirrors standard website login procedures. This system is useful to retain for users who would prefer anonymous or pseudonymous user names unconnected to real world identities. LinkedIn's login system is supported to enable the importing of Skills, detailed below.

User Profiles

The lack of registration requirement supports low thresholds for average users, but the Marketplace also supports high ceilings for users who do seek a more complete user experience, complete with user profiles. The focus of the Marketplace is on connecting volunteers with projects, and any collection of data directly supports this goal.
The Marketplace supports various tiers of user profile: no profile, basic profile, and a full-fledged profile that allows users to display their significant crisis response experience.

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[283] Van Grove, "Each Month 250 Million People Use Facebook Connect on the Web."
[284] Pingdom, "How Many Sites Have Facebook Integration? You'd Be Surprised."

To develop the full user profile, we first surveyed a wide range of sign-up pages, including most V&TC organizations as well as other volunteering platforms. This survey was further informed by my years of experience designing social advocacy campaign pages with a priority on improving conversion rates. In our survey, we first captured common fields already in use, and then eliminated any unnecessary or duplicate fields possible to simplify the page for users. All user information fields other than basic login credentials are optional.

Time zone

Given the global reach of online volunteers, time zone is automatically detected, but confirmable by user.

Picture

User photos are allowed, to encourage community, but not required.

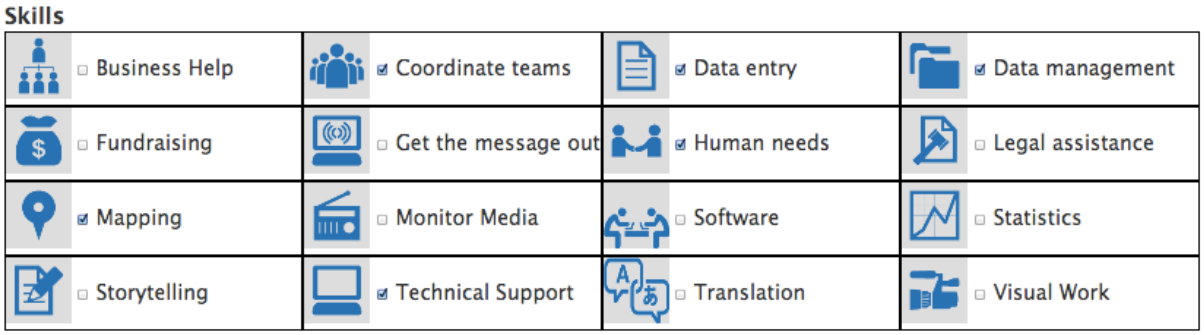
Skills

The Marketplace supports two levels of Skills signaling, depending once again on the proclivity and interest level of the user. At the registration stage, users can select from a simple abstracted list of broad skillsets commonly utilized by digital humanitarian projects, or import the specific skills listed in their LinkedIn profiles. Users that import their professional skills will appear in search results when Project or Organization leaders proactively search the site for volunteers with those abilities.

To generate the shortlist of common participatory aid skillsets, I first condensed the wide range of creative, crowd-driven work discovered during research into the Case Library section into a limited list of broad skillsets that are commonly called upon

by Projects. We developed a responsive grid of alphabetized options that allows volunteers to signal the general areas in which they are proficient. These Skillsets have been provided clearly designed icons, produced by UNOCHA to facilitate quick and simple communication about crises.[285] The result is a simple, responsive design grid of 16 categories.

Figure 4.10: A responsive grid of abstracted Skills buckets for User selection



Volunteers may select one or several categories, which have been chosen to communicate that all volunteers have worthwhile skills (depending on the Needs of the Project). These intentionally broad buckets map well to Project Needs (to be discussed in the Needs section), and can signal broader volunteer expertise or interest without getting volunteers or recruiters lost in a sea of user-generated tags. We are currently arranging conversations with V&TC groups to generate feedback around this selection of Skills, which can be modified and updated at any point.

Marketplace Skillsets:

- Coordinate volunteers
- Data entry

[285] UNOCHA, "OCHA Launches 500 Free Humanitarian Symbols."

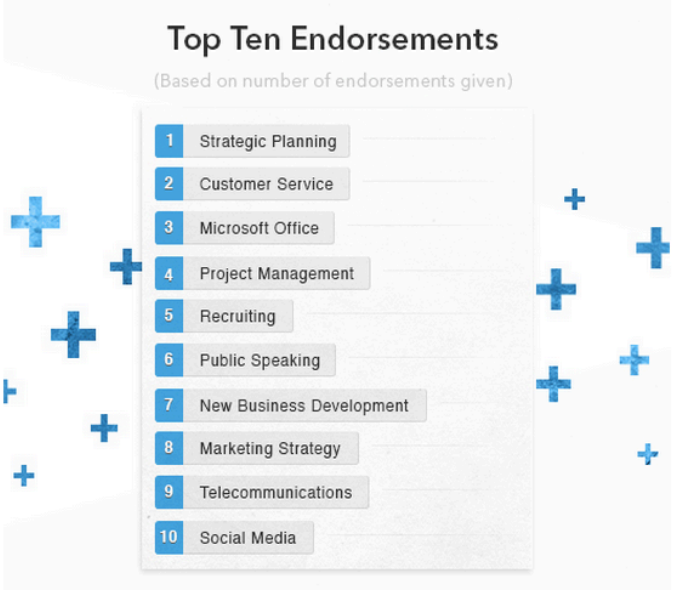
- Data management
- Fundraising
- Get the message out
- Human needs
- Legal assistance
- Mapping
- Monitor Media
- Organizational Support
- Software Development
- Statistical analysis
- Technical Support
- Translation
- Visual Work
- Writing and Storytelling

LinkedIn Skill Importation

Interviews with the aforementioned Taproot Foundation uncovered that LinkedIn's API supported one-click importation of volunteers' resumes and related professional information. In the time since this interview, LinkedIn has further developed their taxonomy of machine-readable Skills. By importing this collection, we benefit from the organization of skills collected and refined from a large user base, as well as future developments with this taxonomy. This avoids the unorganized, duplicate-heavy crowdsourced taxonomies many Web 2.0 sites experienced in the late 2000s. LinkedIn Skills also benefit from a layer of crowd verification: the site asks a user's professional contacts to endorse the user with specific Skills extracted from their profile (or

manually entered). Eighteen million LinkedIn members have made one billion Skills endorsements as of March, 2013.[286]

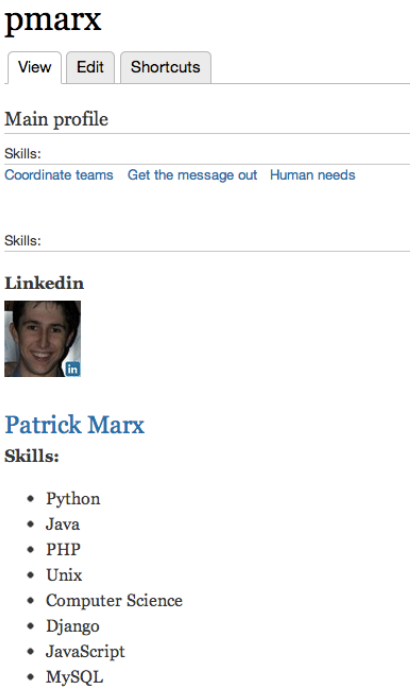
Figure 4.11: Top ten LinkedIn Skills endorsements, sitewide[287]



By importing these Skills into their user profile, potential volunteers can also be found with a simple site-wide search for those terms:

[286] Rusev, "1 Billion Endorsements Given on LinkedIn [Infographic]."
[287] Ibid.

Figure 4.12: Screenshot of LinkedIn Skills importation to User profile



Patrick Marx modified the open source Drupal LinkedIn Integration module (LIM) to integrate LinkedIn profiles into the Marketplace. Writes Marx, "The fact that these skills are pre-sanitized and parsed to fit a standard set of words is a huge benefit to the search capabilities of the Marketplace because it eliminates the possibility of various different entries for a skill meaning the same thing as well as mis-spellings and misnomers."[288]

Twitter (optional)

Twitter has emerged as an ideal semi-public contact channel for many people, where users can be engaged for short messages without disclosing more personal contact information like an email address or phone number. The Twitter Drupal module treats Twitter handles entered as semantic data rather than plain text. So, for example, the

[288] Marx, *6.UAP Final Project Report*.

text of the Twitter handle could automatically link to that Twitter page, or we could generate a Twitter List of users for each project.

Skype (optional)

A common channel for post-crisis coordination, Skype handles remain an important way to get in touch with volunteers and coordinators.

Organization(s)

It is not uncommon for online volunteers and coordinators to maintain multiple concurrent organizational affiliations, so the user profile supports multiple organizational listings. As the user begins typing, the field is auto-populated with a range of existing organizations in this space, although additional groups can be added inline without forcing the user to leave the Profile page.

Geography

Modern browsers will automatically request the volunteer's location information and population these fields in the profile, but only with the user's explicit permission. This information is not exposed to other users, but could support future project recommendations based on physical proximity.

Experience in Previous Crises

One key community norm I've identified since embedding myself in the volunteer crisis response community is the importance of signaling prior crisis experience in establishing trust (as well as prestige). It's not uncommon for digital humanitarians to list the various crises for which they've deployed (virtually, physically, or both). This

practice even manifested itself at the International Conference on Crisis Mapping, where attendees standing to speak will quickly rattle off their portfolio of experience. This display of credentials has been found to be key to other volunteer crowdsourcing efforts, as well, such as the t-shirt designer community at Threadless. When people work primarily for credibility within a community, the ability to signal that credibility must be supported. The Marketplace's support of volunteers broadcasting their work completed will soon include the addition of the ubiquitous social Sharing icons. They were left off the mockups presented in the survey, only for respondents to request their presence. These sharing tools will allow volunteers to signal their involvement in a Project to their broader networks, facilitating serendipitous discovery of new Projects (and likely, flagging of duplicated efforts).

The Marketplace's full Profile fields, while optional, are designed to support this informal social behavior on the site. Users can list multiple organizations they have worked with, as well as the crises around which they've engaged. The field automatically populates with recent crises to prevent duplicate entries, but additional crises can be added inline without leaving the Profile page. We hope to explore the visual appeal of these lists when we reach the theming phase, and could leverage recent platforms like Mozilla's OpenBadges platform to issue (and visually display) portable credentials.[289]

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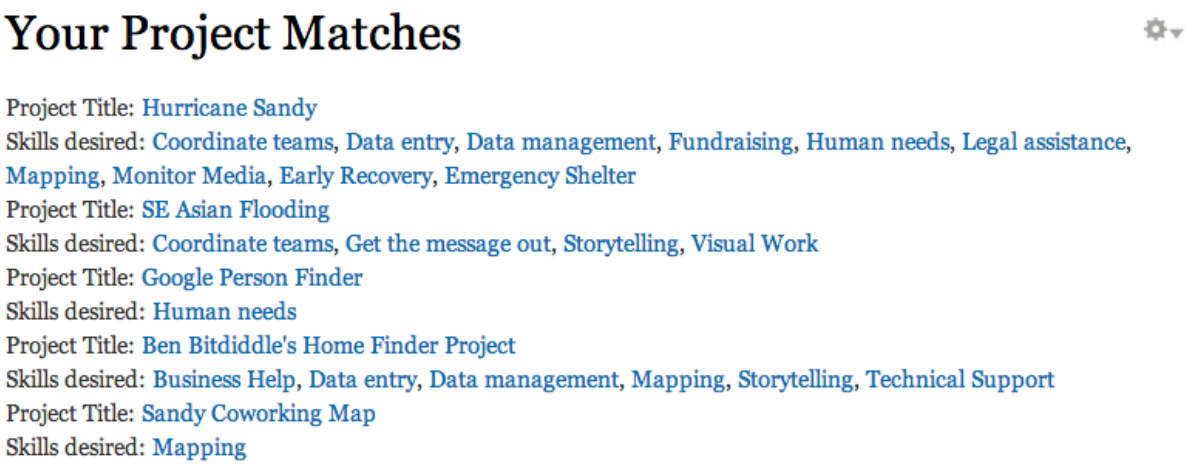
[289] Mozilla, "OpenBadges."

Project Matching

For users who do register and select the skills they have from the grid of broad categories, the Marketplace supports automated Project filtering. Software developer Patrick Marx leveraged Drupal's entity relationships to create basic Volunteer to Product matching Views. The Matches section of the site automatically filters active projects searching for volunteers and filters these projects by the Skills the volunteer has listed in their profile. Results are sorted in reverse chronological order to favor recent Projects and recent Crises, although additional filters can be exposed to allow other sorting methods.

Figure 4.13: Matching volunteers to Projects based on Skills



Crises

The majority of the Views, and therefore the user experience, have been designed and configured to support response efforts to a specific crisis at hand. Rather than assume, as other volunteering sites do, that a majority of volunteers are endlessly altruistic, we operate on the assumption that news, word of mouth, or other motivation has created

empathy and a desire to act in response to specific events. The Marketplace seeks to capture the attention and interest of the sudden influx of potential volunteers who materialize in the wake of crises.

The platform can easily accommodate multiple crises, and I hope to eventually support a long tail of events, not limited to those events covered by the US evening news. But I do assume pre-existing motivation of some kind to drive desire to engage in the listed projects.

Crisis-specific subdomains acknowledge that motivation is often related to the actual specific crisis rather than overriding sense of altruism. This specific feature was recommended in the Congressional Research Services report, which argued that by establishing a single page for each incident, "FEMA could provide a wide range of information relevant to the specific event including evacuation details, food, water, and shelter locations…The same web page could later serve as an information portal for recovery, and ultimately be retained after the recovery and serve as a historical document."[290]

The Crisis pages include the same standardized Skillsets grid of options seen in User Registration and Projects. This selection includes many of the pre-identified ways participatory aid projects have helped in the past, but the Crisis page also allows users to enter and express additional Needs unique to this Crisis. Exposing these Needs enables the emergence of creative solutions and is important to facilitating mutual aid.

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[290] Lindsay, *Social Media and Disasters: Current Uses, Future Options, and Policy Considerations*.

4.5.2 Project Leads

As discussed in the Persona section, the Project Lead wants their work listed among other response efforts to receive appropriate credit and communicate its existence to other responders. If the project is seeking additional volunteers, the Project Lead may want to be listed where volunteers can easily find and join the effort. It's also highly possible that a Project Lead would like other coordinators to know about the Project, but would not like to attract additional attention from untrained volunteers in the middle of a crisis. For this reason, the simple "Accepting volunteers" checkbox appropriately toggles where the Project will be seen throughout the Marketplace. An official RSS feed might include the project amongst all others, for example, for the purposes of coordination, while the project would not appear in the listing of volunteer opportunities.

Check-Ins

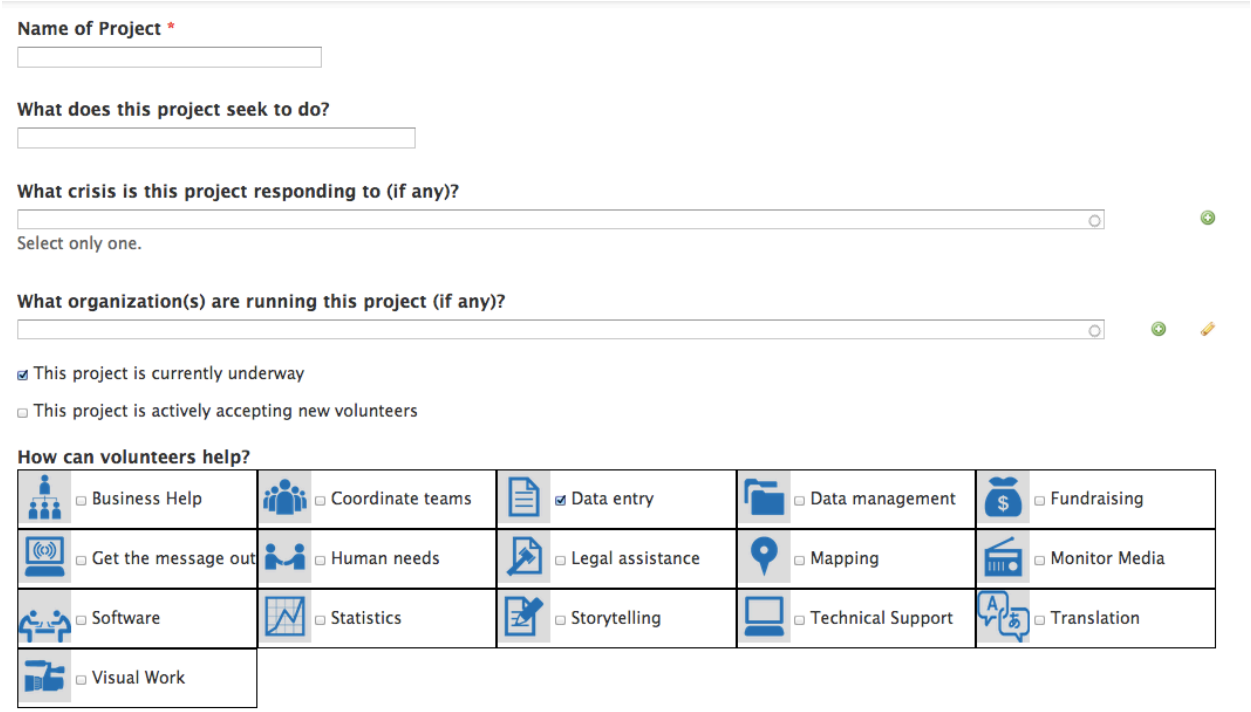
The desire for an organizational check-in page was clearly expressed in my interviews with V&TC leaders and coordinators. The network of groups represented by the Digital Humanitarian Network organizes many of the participatory crisis response projects, so designing with these groups in mind could help ensure that the Marketplace actually becomes a central aggregator of active projects.

Although they represent a relatively small network of groups, members of the Digital Humanitarian Network expressed a lack of awareness of each other's engagements, and would prefer an easier way to find out where and what one another are doing to help in various efforts. Focused professional groups were particularly

interested in this feature, as they would like to be useful, but may need to be solicited by other groups with active projects before they become involved in a response.

With significant feedback from the V&TC groups interviewed, I've designed a simple check-in page where Project Leads and V&TC coordinators can announce their involvement and watch it automatically syndicate to relevant allies.

Figure 4.14: Add Project screenshot



The Add Project page asks for:

- Project Name
- One-sentence description of Project objective(s)
- The specific Crisis the Project responds to (an auto-populated list)
- The Organization(s) administering the Project
- A binary choice between an Active or archived Project
- A binary choice to determine if the Project is seeking new volunteers

- The standardized grid of Skillsets the Project's leads seek from potential volunteers, which mirrors Volunteer profiles
- The hours per week desired from volunteers (this field will be tested for usefulness)
- The URL of the Project sign-up page or coordination channel. Rather than reinvent the wheel, we send Volunteers directly to existing listservs, chatrooms, or other discussion forums, or intake CRMs. This field treats URLs as links, not plain text, allowing additional modifications (like turning the links into Join buttons on the homepage)
- The Project webpage for additional information. We worked to implement Facebook-style pre-fetching of the URL's title and a sample image, but this Drupal module is outdated. This is an area for future user experience improvement.
- A Twitter contact for the Project, to allow for rapid inquiries and assessments of the Project's activity level without requiring Project Leads to return to the Marketplace to signal updates. In the future, I would like to explore automatically gauging the liveliness of a project based on this Twitter Field (if populated) and signaling it to potential Volunteers.
- The Project's Start and End dates, if known. This data allows us to automatically hide Projects which have ended.
- An RSS feed for the Project. We do not expect many users to enter data in this field, but if they do, we can display project updates on the page itself as another way to indicate the liveliness of a Project.

Digital Humanitarian Projects

There is additional logic behind the Add Project form to support users designated as members of the Digital Humanitarian Network (or related groups). When this class of user adds a Project, the site will automatically append the information and send it in an email to a desired address. This would allow DHN members to fill out this

form once and simultaneously notify the rest of the network via its Google Group. DHN-specific Projects are also listed in a segregated View showing all Digital Humanitarian Network engagements, to improve intra-network discovery as expressed by interviewees.

Projects run by DHN groups or other V&TC organizations could also be configured to display the Organization's Codes of Conduct or Volunteer Liability Release forms on the Projects themselves. Drupal's Token feature would allow these agreements to be dynamically listed on Project pages, in addition to their presence on those Organizations' sign-up pages. These agreements are important for two reasons. First, they could help limit some of the liability V&TCs face, the details of which was identified by the Wilson Center in a special report.[291] These agreements are also important informally in maintaining the desired culture and expectations amongst new waves of volunteers.

4.5.3 Formal Aid Actors

A secondary but still worthwhile goal of the Marketplace is to improve formal aid actors' desire and ability to better integrate the populist energy of participatory aid into traditional operations. This is a complicated equation, but some basic technological decisions have been made to help support this effort.

First, the case library itself is a resource that can be built upon and referenced going forward to illustrate the wide range of ways participatory aid can benefit crisis

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[291] Robson, *Responding To Liability: EVALUATING AND REDUCING TORT LIABILITY FOR DIGITAL VOLUNTEERS*.

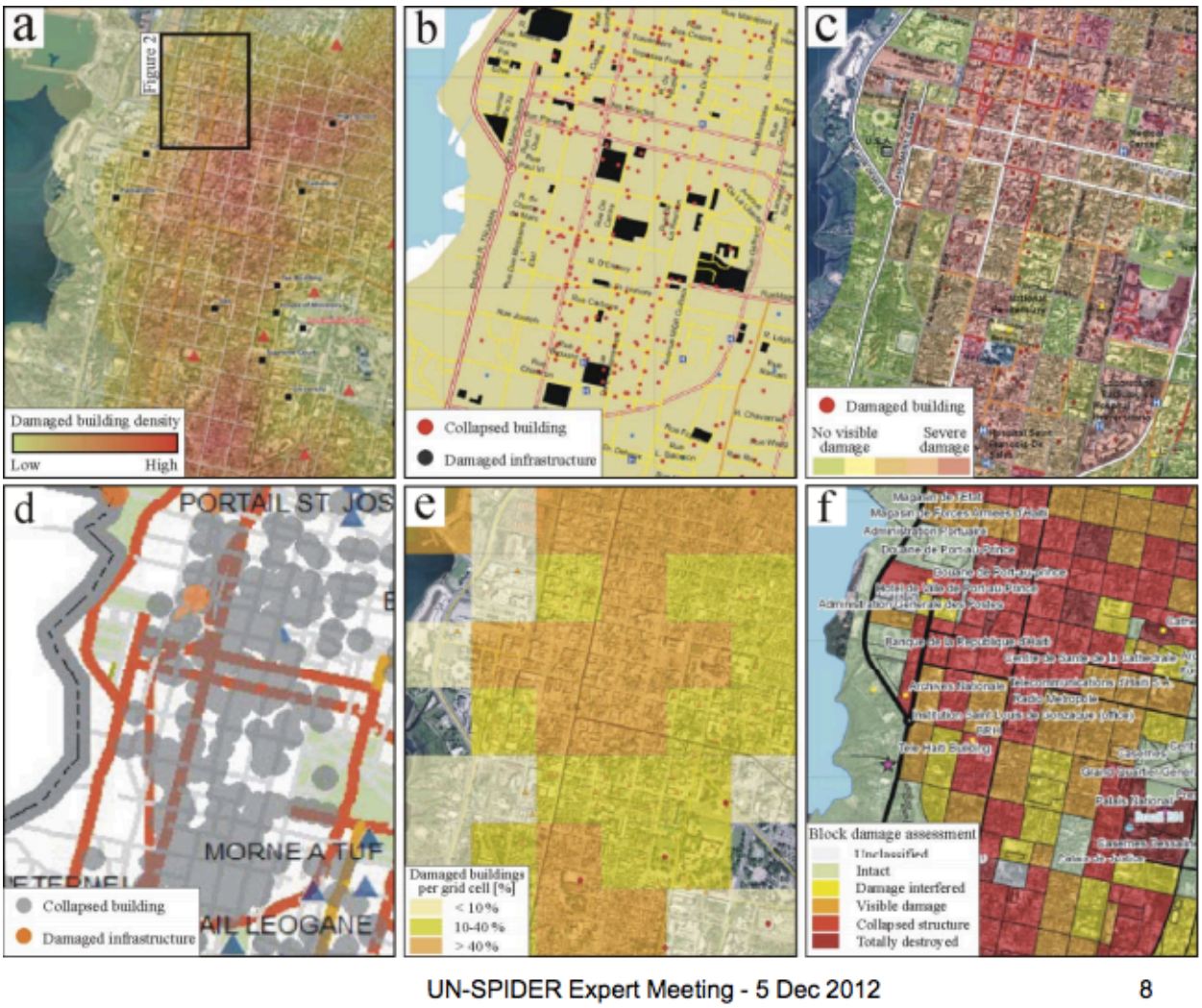
response work. There is interest at UNOCHA to build out a similar case study library, and this collection could offer a starting point for that research.

4.5.4 Coordination of Participatory Aid

Improved coordination of participatory aid work is a major priority necessary to gain broader acceptance of V&TC efforts at the formal aid level. Coordination of efforts is worthwhile for its own sake, as it could help reduce duplication and better allocate limited resources. Cooperation allows markets to grow and new practices to take hold. And interoperability, technical or cultural, allows "unprecedented and unexpected consumer expression and creation."[292]

[292] Palfrey and Gasser, *Interop: The Promise and Perils of Highly Interconnected Systems*, p70.

Figure 4.15: An example of the fragmentation of mapping efforts in Port au Prince[293]



Coordination is an unsolved challenge across the formal aid space, so it's unsurprising that the influx of new actors delivering participatory aid have run into similar issues. In the formal aid sector, merely keeping track of the myriad databases,

[293] Kerle and Hoffman, "Collaborative Damage Mapping for Emergency Response: The Role of Cognitive Systems Engineering."

reporting mechanisms, and needs assessment initiatives is a difficult task, as discussed in UN-OCHA's ACE report.[294]

One of the primary goals of the Participatory Aid Marketplace is to grow this nascent space by supporting interoperability and coordination between disparate actors. The legacy coordination systems discussed in Related Work often amount to a repurposing of tools built for basic communications: email, Skype chatrooms,[295] and Google Docs. The innovator's challenge is to maintain the convenience and simplicity of these tools while introducing far more powerful actions with more interoperable technologies. One strategy to accomplish this feat is to provide for backwards compatibility with known communication platforms. For example, when a member of the Digital Humanitarian Network adds a Project, the site emails the content to existing listervs in addition to listing the Project in far more advanced RSS and XML feeds and custom site Views. This strategy allows communities to adopt over time (or not) to new technologies while facilitating the original goal (distribution of news of a deployment).

The Marketplace could achieve its central goal of tracking Who's Doing What, Where if it can convince a small number of users to enter listings as they find them. This work could be done on an ad hoc basis by users who like to categorize content, or could be assigned to a V&TC team already monitoring professional and/or social media in the aftermath of a disaster. The research and data entry tasks involved in contributing emerging Projects to the Marketplace could prove an ideal volunteer

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[294] UN OCHA, *ASSESSMENT AND CLASSIFICATION OF EMERGENCIES (ACE) PROJECT: MAPPING OF KEY EMERGENCY NEEDS ASSESSMENT AND ANALYSIS INITATIVES (p.35)*.
[295] Starbird and Palen, "Working and Sustaining the Virtual 'Disaster Desk'."

opportunity in its own right, in line with the crowdsourced research work discussed in the Case Library.

Another way the Marketplace could support coordination would be to allow administrators or Project Leads to merge similar project entries in the database. There is a strong desire by V&TC leaders to combine duplicate efforts rather than balkanize resources like attention and volunteer help. Participatory aid leaders like Gisli Olafsson established Skype chatrooms during the Sandy recovery to help coordinate the involvement of multiple groups. Serious conversations must occur between Project Leads before any merging takes place, and these are likely to remain private conversations, but the Marketplace could support such behavior technically by allowing the combination of Project listings.

Interviews with V&TC leaders established the presence of a pervasive frustration with duplication of participatory aid projects. Some degree of overlap is likely inevitable, as multiple actors work to find the best way to accomplish various tasks, like monitor social media. But other overlaps can prove costly and damage the efficacy of projects because of fragmentation of effort. Rather than impose a top-down decree, which would not work in the creative, messy participatory aid space, I focus on helping these outside groups and individuals find one other (by listing Project, Organization, and user contact information) and collaborate.

4.5.5 Managing Volunteer Influx

The other major coordination challenge in participatory aid is mitigating the sharp influx of untrained volunteers that can occur when a crisis makes the news. Ever

growing numbers of people turn to social media and search engines to find information and ways to help. The Marketplace seeks to help V&TCs and other Project Leads to better manage this pipeline.

Core to the Marketplace's Project listings is the ability to signal if the Project Lead actually seeks additional volunteers. If the Lead does not, the Project will not appear in the volunteer-facing sections of the site. The "All Active Projects" View is a single page where individuals and groups considering starting a new Project can scan existing work, and ideally, join forces or reapply their energy elsewhere if a response is already underway.

In addition to signaling achievements, the User Profiles are useful because they could allow groups to identify individual volunteers. Several of the groups I interviewed (e.g. Taproot Foundation, GISCorps) maintain professional CRM systems to keep track of the many individuals who volunteer on behalf of the organization. When a volunteer is a poor fit, it can have major costs for project in terms of time, efficacy, and other volunteers' morale. Even if a Project Lead does not have access to a heavily annotated CRM, the Project history and usernames in users' profiles could help Project Leads find mutual contacts and other signals to determine a potential volunteer's abilities. Ideally, the Marketplace's presentation of multiple ways to help in a crisis could lead unused volunteers to be referred to more appropriate projects, rather than outright ignored.

I also derived inspiration from a commercial industry with similar problems managing large influxes of skilled people: job recruiting websites. Recruiters are often faced with a deluge of résumés, and an industry has sprung up to narrow down their

choices (for a fee). This class of website inspired two Marketplace features and potential future work. First, I've designed a workflow using Drupal's Rules module, whereupon the profiles of new Users with given skillsets can be automatically emailed to given Project Leads. This would allow certain talented volunteers to be immediately contacted by Project Leads in need of their expertise. By sending this information as a simple email, I ensure it will reach the Project Lead, and also open up the possibility of applying advanced email filters to these alerts.

The second feature inspired by job sites is the use of LinkedIn to extract specific professional language. Future work could include further development of features found in successful job recruiting platforms, like allowing recruiters to prioritize the skills they need with weightings.[296] This type of feature could help V&TC groups manage influxes of volunteers and sift out the high value volunteers, depending on the project. Volunteers with no immediately relevant skills are directed to microwork projects and giving opportunities.

Job sites themselves could even provide specific talent to V&TC efforts in need. The Taproot Foundation receives millions of dollars a year in the form of in-kind donations of advertising inventory from websites like Craigslist, Idealist, and Dice.com.

On the less specialized end of the skills spectrum, we might try to ensure that there is always a productive microwork project or, at very least, donation opportunity, to improve the likelihood that every user is provided at least one channel of aid within which to contribute their efforts.

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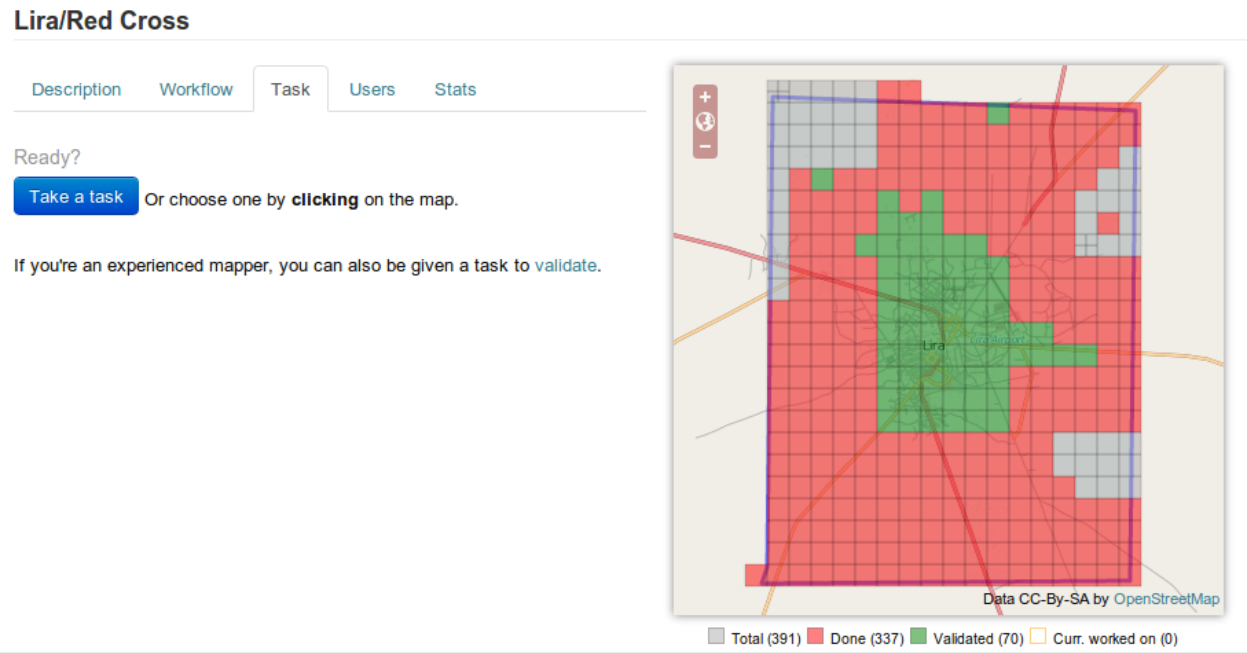
[296] See taloom (http://www.softgardenhq.com/products/taloom/features/)

Semi-Automated Volunteer Training

One reason the influx of new volunteers poses a challenge is because the current methods for training and orientating these fresh recruits doesn't scale at anywhere near the levels at which volunteers may arrive. Several participatory aid groups have developed automated or semi-automated processes to help volunteers learn how to contribute that improve upon triaging a stream of messages in a crowded chatroom.

Figure 4.16: HOT task manager walks volunteers through the microwork process



The HOT Tasking Manager improves the volunteer training and activation workflow for microwork volunteers. This coordination platform allows administrators to prioritize jobs that can be broken into discrete tasks for a large number of volunteers. A given map is broken into a grid of squares. Volunteers then log in and claim one square of area at a time (or split the square into smaller pieces, if it covers too much land). The

Tasking Manager allows volunteers to load their area of the map into desktop mapping software like the cross-platform Java OpenStreetMap Editor. From this program, volunteers can trace over the satellite photo with a digitized layer, and then upload this section back to the master layer. Volunteers' work can then be easily validated by project administrators.[297]

At a UN-SPIDER Expert Meeting, Norman Kerle and Robert R. Hoffman pointed to Tomnod mapping platform[298] as a solution that teaches crisis mapper volunteers to identify refugee shelters in satellite imagery.[299] They also noted that the CrowdRank platform allows groups to test the reliability of new volunteers with sample data. The platform can provide corrective feedback and validate the tasks volunteers complete. This is similar to work done to verify workers on Amazon's Mechanical Turk platform where up to 10% of the answers in a set are already known, and used as "gold" data to assign trust scores to workers (e.g.[300]). The continued investment in massively scalable online learning software (known as MOOCs) could pay dividends for volunteer training, and future work might include efforts to repurpose these pedagogies to take in large numbers of new volunteers in a scalable manner (at least for projects that can offer large numbers of volunteers a way to participate, such as crowdsourced image assessment).

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[297] For a tutorial of this software, see http://www.youtube.com/watch?v=ljaIaBp3LA8&feature=youtu.be.
[298] http://tomnod.com/
[299] Kerle and Hoffman, "Collaborative Damage Mapping for Emergency Response: The Role of Cognitive Systems Engineering."
[300] Ipeirotis, Provost, and Wang, "Quality Management on Amazon Mechanical Turk."

4.6 Survey Evaluation

We consider the Marketplace a prototype, given the extreme importance of server reliability and site security for any live crisis application. Concepts, configurations, and workflows could easily be adopted from this prototype, or additional development work could get it to a production-ready state. A disaster simulation would be an ideal forum to test the use of this platform with actual V&TC groups.

In addition to iteration with V&TC leaders, I designed a survey to gauge whether two samples of the Marketplace's core views were effective in providing potential volunteers with a sense of agency. After drafting several rounds of survey questions, I launched the questionnaire on SurveyMonkey to make use of its advanced features.

4.6.1 Recruitment

My goal for the respondent sample was to attract digitally savvy people with some existing degree of civic engagement. I avoided channels likely to recruit close friends, such as Facebook, emails to personal contacts, or Media Lab listservs. I did promote the survey on the broader Civic Media Researchers listserv and my Twitter account, because each reaches a large percentage of people I have never met and with whom I have no social ties. The communication channels I did use to recruit reach people who are relatively heavily involved in participatory aid efforts, such as V&TC groups. As a result, survey respondents include many leaders and volunteers from the V&TCs themselves.

4.6.2 Analysis of Results

138 unique respondents took the survey. The respondents were exactly split on their experience in crisis response: 50.0% are already active in crisis response, while the other 50.0% are not. There was a similar split between respondents who had been affected by a crisis themselves (or whose loved ones have been affected).
The respondents are heavily civically engaged, as measured by in-person volunteering: 60% of respondents have volunteered in person in the last year, more than double the average US rate of 26.5%.[301] Respondents are also relatively young, with a median age of 34.

The respondents are confident that they have valuable skills to provide to a community in need (88%). And they are very technologically savvy: 90% of the respondents agree or strongly agree that they are comfortable with digital technology. And yet a majority (55.8%) do not have a clear sense of where they might go to provide their skills or services in a time of crisis. Despite this lack of path, 86% of the respondents answered that they would donate their time to a community in need.

4.6.3 Treatment

The full list of survey questions is listed in Appendix 2. Respondents were asked to examine two screenshots illustrating the Participatory Aid Marketplace (also found Appendix 2). Screenshot 1 shows a mockup of a Crisis page, with three sample Projects listed. Screenshot 2 shows a sample of the user Profile page, where the two

[301] Bureau of Labor Statistics, "Volunteering in the United States, 2012."

mechanisms for listing Skills are displayed. Respondents were then asked a second round of questions, including several identical follow-up queries.

4.6.4 Response

After seeing the screenshots with sample Projects cards and the volunteer Skills grid, the number of respondents who report feeling that they could provide their skills or services to a community in need rose from 87.7% to 96.1%. I consider it a strong sign that exposure to example participatory aid Projects and a look at the Skills entries appears to boost an already strong sense of self-efficacy. More decidedly, the Marketplace screenshots had a very strong effect on the reported understanding of how respondents would find a way to help. The 55.8% majority who did not have a clear sense of where they would go to provide their skills in a time of crisis became, after the screenshot treatment, a 92.1% majority in agreement that the Marketplace would help them find ways to contribute (the primary goal of this thesis). Additionally, 87.4% of respondents agreed that they could see themselves referring to a website like this one to do just that. 85.1% of respondents declared themselves moderately, very, or extremely likely to use this project marketplace to help respond to a crisis. Equally large numbers (83%) declared themselves very likely or extremely likely to recommend the service to others looking for ways to help.

The screenshot treatment actually slightly depressed the number of respondents who would choose to donate their time (Δ-6.1%), while doubling the percentage of people who offered to donate money instead (Δ+12%). It's possible that asking people to think about the specific tasks involved in donating time simply made them

remember the convenience of their credit cards. It's also possible that the three specific Project examples in the screenshot were not enticing options. The Project examples selected in the screenshot were three participatory aid responses to Hurricane Sandy: Sandy Coworking Map to share office space, the Sandy Memorial webpage honoring those who lost lives, and Occupy Sandy's Amazon Wishlist allowing direct donations of supplies (see Appendix 2). Alternate projects could be tested in a follow-up survey to learn if this is the case.

A free form question asking how to improve the chances respondent would use the marketplace identified several challenges respondents would like to see addressed. Some of the most relevant and expressed desires include:

- Respondents need time in their life to volunteer in the first place
- Several respondents pushed back against the visual, 'glossy' style of the sample designs and stated they would prefer a more bare display of information
- Multiple respondents sought (limited) email notifications, to 'pull' rather than 'push' volunteers when they are needed
- Social features (in the sense of who else is using the platform, friends and strangers alike, as well as some communications from beneficiaries)
- Visible endorsements and/or connections to existing emergency groups
- Verification and/or ranking of the actual Projects and supporting Organizations, and assertive curation of projects to limit time lost to less effective opportunities
- Communicate Project outcomes: Efficacy of action taken, carefully curated Projects
- Volunteers seek discretely defined tasks that allow them to scale back if needed after initial contributions
- Respondents echoed the strong desire for automatically-filtered content to limit information overload

4.6.5 Prototype Demo and Additional Feedback

An initial round of interviews established common needs and desires amongst V&TC leaders (such as a central organizational check-in form, and some groups' emphasis on Code of Conduct agreements). I invited a second round of conversation with the Digital Humanitarian Network community and related actors following the development of the check-in form (which is essentially the Add Project form detailed earlier). This feedback directly informed the development of the abstracted Skills categories and the addition, removal, and modification of many of the fields. For example, I removed the mandatory requirement for several fields that do not fit all occasions. Multiple V&TC leaders requested the field soliciting an RSS feed, which I initially considered extraneous. The community managers and project organizers also identified metrics I had not originally considered: hours per week requested of volunteers, and optional project start and end dates, given the restricted timeframe of some V&TC deployments.

5 Next Steps and Future Work

In the short term, the Marketplace site hosts an actively curated collection of the Case Library and tools to allow filtering of existing projects by the needs they address. Our development team will spend the next month improving the user experience of this platform to invite others to grow the collection of resources.

It has not been possible to fully field-test the prototype in an academic environment or within the timeframe of this thesis. I have collected evaluations in the form of anonymous survey as well as many qualitative interviews and ongoing conversations. I am currently scheduling demos of the site's persona-driven workflows in order to gather an additional round of feedback from the same contacts to further evaluate the platform. We will also spend the weeks ahead adapting the Marketplace's features and processes to this next round of feedback.

5.1 Future of the Marketplace

The platform's core features are in place, but there is still significant work to be done, including evaluating the site's efficacy in actual crisis situations. A full evaluation of this project will require bringing the prototype to life in one form or another. Its success or failure will then depend on a variety of factors beyond tool design, from securing funding for development to user uptake of the site. I may seek funding or staff support from formal aid institutions to bring the platform to market. I may also work with these groups to integrate certain aspects and features of the site into more heavily supported platforms in order to ensure its long-term sustainability.

Another path would be to continue to work with the participatory aid networks I have assembled over the past two years to maintain the project as a community effort. The Digital Humanitarian Network, in particular, could benefit from the Project check-in process for which several of their member groups have expressed desire. The Marketplace is designed to support multiple administrators, who could curate and solicit content as expertise and related work suggest. This path could consist of forming a lightweight NGO to administer the platform and arrange strong partnerships.

5.2 Future Design Directions

In the context of the Participatory Aid Marketplace, I am interested in whether encouragement of volunteer ratings of active projects could improve volunteer management over time. Volunteers could rate their experience with projects, how they were managed, and perceived impact of the project. Researchers could also invite other actors to rate projects and introduce 360-degree, real-time evaluations to improve impact assessment.

One could also compare multiple V&TC approaches to managing volunteer influxes and then design platforms like HOT's Tasking Platform to orientate and train incoming volunteers in a more fluid and scalable manner. Volunteer feedback and basic analytics goals would allow researchers to A/B test various approaches to this problem.

Another area for future design is a "liveliness algorithm" to assist users in quickly determining the momentum (or lack thereof) of a participatory aid project. A web

service could quickly ping the project's RSS feed, Twitter account, and news and blog mentions for signs of activity.

If the Marketplace reaches a level where it lists a large set of active projects, we could develop an algorithm to combine volunteer ratings and the project's liveliness score to automatically rank and promote worthwhile projects to users.

5.3 Future Research

My research has surfaced a number of questions worthy of further investigation. One area of possible research is diversion of surplus attention from crises with relatively few opportunities for volunteers to contribute towards under-supported crises happening in the same timeframe. Shifting a small percentage of attention would be a victory in the context of crises with no attention.

A related area of research would test the ability to time-shift volunteers' offers of aid with mechanisms like a personal pledge, which has been shown to produce significant upticks in voting behavior.[302]

Another experiment with attention would recruit an interdisciplinary team of media professionals (like those discussed in section 3.3.6) to generate attention on behalf of a relatively unknown crisis, and measure any net increases in spotlight and aid.

[302] The Analyst Institute, unpublished

6 Conclusions: Towards the Integration of Aid

> "Changing complicated systems can be costly. There is strong inertia, and there may not be incentive for the powerful to change. Processes are too embedded."
>
> John Palfrey and Urs Gasser[303]

Modern crises require too much assistance from all of us for aid organizations to leave most of the world sitting on the bench. There's too much potential value, potential energy, and real empathy not being captured by traditional crisis response. Crises are occurring frequently, natural disasters are growing stronger, and the world's social and political institutions are rapidly shifting. We need to embrace a more holistic and participatory approach to recovery. Gisli Olaffson describes the divided landscape today:

> The traditional systems are top down, with information flowing mostly to the top, while the participatory efforts are a tangled web of networks with little or no entry points into the traditional systems.[304]

For this to happen, we need to update the conventional wisdom of disaster response. Financial donations are no longer necessarily the most valuable way for engaged members of the public to support recovery. Helping a community get back on

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[303] Palfrey and Gasser, *Interop: The Promise and Perils of Highly Interconnected Systems*. p41.
[304] Email with author, April 30, 2013

its feet is no longer a job exclusively for the professional emergency response industry, as critical as its responses are to recovery.

Communications technologies have opened up new possibilities for self-organizing individuals, be they members of diasporas, skilled professionals, hackers, startup employees, or cultural representatives, to play in helping a community bounce back from a crisis. These groups are introducing a much more holistic view of recovery than simply fulfilling the basic human needs of water and shelter, although we've seen these groups address these basic needs.

We must support these trends by investing, as communities and as nations, at levels that begin to approach our investments in formal crisis response. One of the biggest impediments to the current generation of participatory aid volunteer groups is a dearth of funding to formalize processes and sustain the technologies necessary to scale to accommodate sharp influxes of volunteers responding to a steady stream of crises.

There is a tendency, in resource-strapped times, to take mutual aid for granted. But this trend must be nurtured and supported with resources and expertise of formal systems, or some of the amazing generative energy and creativity we see today could dissipate if it’s not adequately supported.

There is increasing awareness that integration of formal and mutual aid is desirable. Meier quotes the head of FEMA stating, at the Emergency Social Data Summit organized by the American Red Cross in 2010, “It is high time” that crisis

response organizations start viewing the public as part of the team.[305] Meier writes elsewhere that the UN and other formal aid organizations "wouldn't touch" V&TC work a year before the Libyan civil war, but the utility of the volunteer-built crowdmap of social media content has proven some of their value.[306]

A variety of efforts have sprung up to build better interfaces between aid sectors. UNOCHA sponsors small research grants to improve interfaces between aid sectors. The Open Humanitarian Initiative is working to bring together actors from formal aid, mutual aid, private business, and technology. In a 2011 congressional hearing, Crisis Commons's Heather Blanchard called for a parallel emergency support structure to support mutual aid and a liaison to the formal aid system via FEMA[307]in a congressional hearing. But progress is slow, and the formal aid culture is entrenched. It is not clear that FEMA heard the call.

The Social Media in Emergency Management report provides a high-level overview of what the formal crisis response sector will need to appreciate and integrate with participatory aid groups in the years ahead,[308] as does the OCHA-supported Guidance for Collaboration with Volunteer & Technical Communities report in 2012.[309] There is real tension in determining the role peer aid and V&TC groups should play in society. Should they fill in technological vacuums, as slow-moving formal aid institutions fail to move quickly to take advantage of new possibilities? Should they

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[305] Meier, "The Crowd Is Always There: A Marketplace for Crowdsourcing Crisis Response."
[306] Meier, "MatchApp: Next Generation Disaster Response App?".
[307] Blanchard, "Responding to Congress: Importance of Participatory Crisis Management CrisisCommons."
[308] III, Wardell and Su, *2011 Social Media Emergency Management Camp Transforming the Response Enterprise*.
[309] Capelo, Chang, and Verity, *Guidance for Collaborating with Volunteer & Technical Communities*.

subvert institutions entirely, as Occupy Sandy did? Or should they work on behalf of formal aid institutions, which often see online volunteers as an inexhaustible source of free labor, if trustworthy to begin with? Some thoughts from V&TC convener Willow Brugh might be kept in mind as we figure out the answer:

- Traditional response doesn't have the capacity it needs
- Citizens should be the masters of their own fates
- People are engaging in peer-to-peer and self-rescue anyway
- Groups like FEMA can try to help and guide this action, or become irrelevant

The modern emergency management organization will need to transform at a more fundamental level than "establish a Twitter presence" to remain relevant in a world of dis-intermediated aid. Wardell and Su cite the study of large-scale systems change[310] to consider the complexities of changing the "response enterprise" of the formal aid system. There are a variety of parallel, overlapping national crisis response systems in the US, but these federal coordination systems don't adequately consider the recently expanded role of informal actors. This work is primarily focused on establishing the value of these participatory aid actors in the hopes that we can benefit from the strengths of each system.

This will require us to:

1. Encourage the growth of participatory aid efforts (and also introduce some formal process to sustain these experiments, where desired)
2. Begin to adapt the culture within formal aid organizations to better recognize, coordinate with, and benefit from participatory aid

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[310] Rouse, *Enterprise Transformation: Understanding and Enabling Fundamental Change.*

3. Collectively expand our imagination and raise our expectation of what the public can contribute to recovery when so inspired

The Participatory Aid Marketplace is a small step in this process, a practical contribution as well as a thought experiment, designed both to strengthen the emerging practice of technology-driven mutual aid, and to call attention to tensions in this space. Should it gain traction, it might present a model that allows formal and informal aid organizations to work hand in hand and make the hard work of crisis response a process where citizens feel empowered to create and contribute as valued, critical actors rather than as passive observers or donors.

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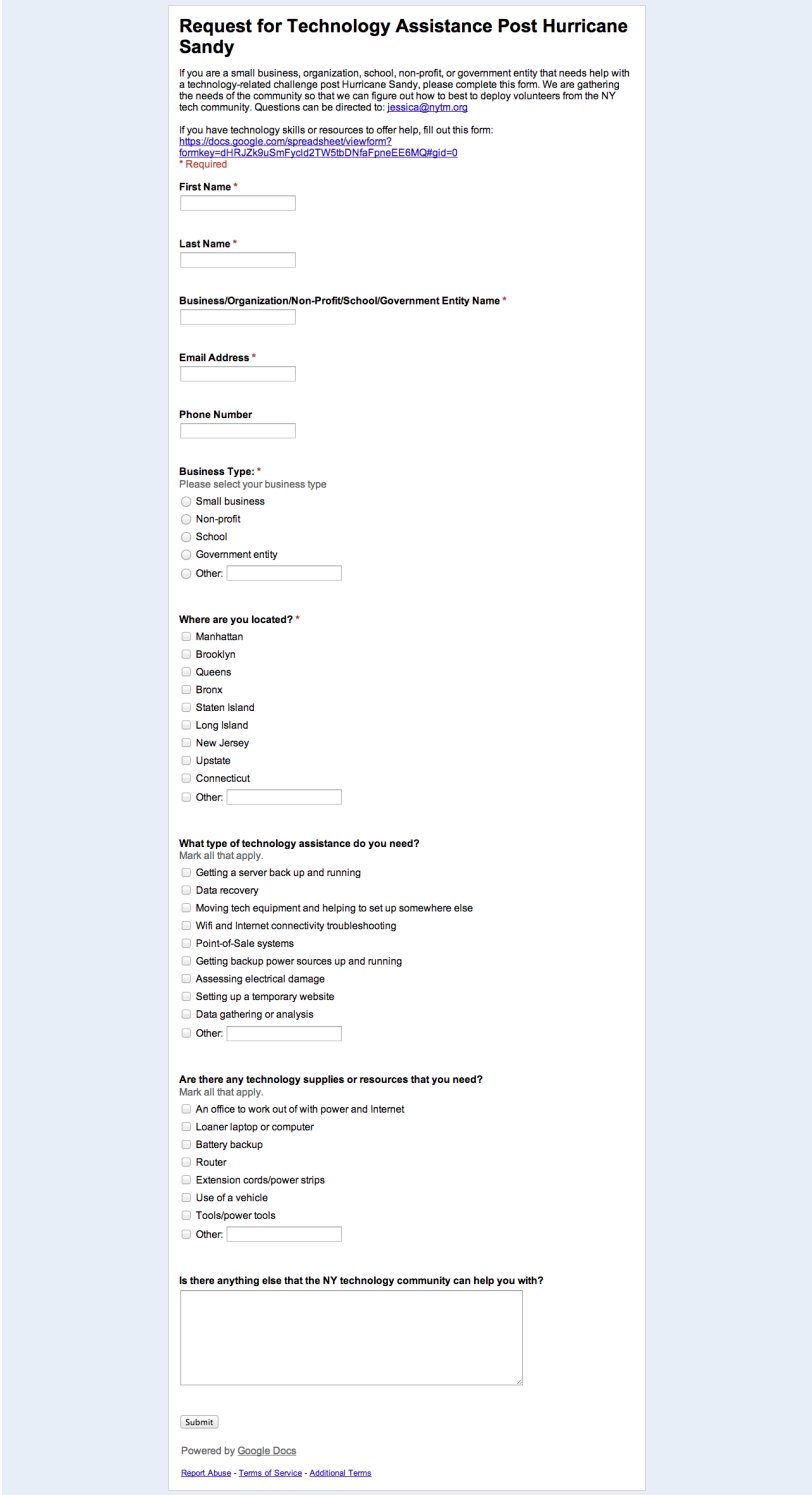
Appendix

Appendix 1: New York Tech Meetup's Recruitment Google Form



Request for Technology Assistance Post Hurricane Sandy

If you are a small business, organization, school, non-profit, or government entity that needs help with a technology-related challenge post Hurricane Sandy, please complete this form. We are gathering the needs of the community so that we can figure out how to best to deploy volunteers from the NY tech community. Questions can be directed to: jessica@nytm.org

If you have technology skills or resources to offer help, fill out this form: https://docs.google.com/spreadsheet/viewform?formkey=dHRJZk9uSmFycld2TW5tbDNfaFpneEE6MQ#gid=0

* Required

First Name *

Last Name *

Business/Organization/Non-Profit/School/Government Entity Name *

Email Address *

Phone Number

Business Type: *

Please select your business type

- ○ Small business
- ○ Non-profit
- ○ School
- ○ Government entity
- ○ Other:

Where are you located? *

- ☐ Manhattan
- ☐ Brooklyn
- ☐ Queens
- ☐ Bronx
- ☐ Staten Island
- ☐ Long Island
- ☐ New Jersey
- ☐ Upstate
- ☐ Connecticut
- ☐ Other:

What type of technology assistance do you need?

Mark all that apply.

- ☐ Getting a server back up and running
- ☐ Data recovery
- ☐ Moving tech equipment and helping to set up somewhere else
- ☐ Wifi and Internet connectivity troubleshooting
- ☐ Point-of-Sale systems
- ☐ Getting backup power sources up and running
- ☐ Assessing electrical damage
- ☐ Setting up a temporary website
- ☐ Data gathering or analysis
- ☐ Other:

Are there any technology supplies or resources that you need?

Mark all that apply.

- ☐ An office to work out of with power and Internet
- ☐ Loaner laptop or computer
- ☐ Battery backup
- ☐ Router
- ☐ Extension cords/power strips
- ☐ Use of a vehicle
- ☐ Tools/power tools
- ☐ Other:

Is there anything else that the NY technology community can help you with?

Submit

Powered by Google Docs

Report Abuse - Terms of Service - Additional Terms

Appendix 2: Online Volunteer Survey

Online Volunteer Survey

We're designing a website to list online volunteering projects that respond to crises (like natural disasters).The purpose of this project is to give you, a potential digital volunteer, a meaningful way to donate your time to help communities in need during a crisis.

***Do you consent to participate in this survey?**

You have been asked to participate in a research study conducted by Matt Stempeck from the Center for Civic Media at the Massachusetts Institute of Technology (M.I.T.) (http://civic.mit.edu). The purpose of the survey is to determine the degree to which people feel they can help a community in crisis using technology. The aggregate results and of this survey will be included in Matt Stempeck's Masters thesis. You should ask questions about anything you do not understand (to stempeck@mit.edu), before deciding whether or not to participate. This survey is voluntary. You have the right not to answer any question, and to stop the survey at any time or for any reason. We expect that the survey will take about 15 minutes. You will not be financially compensated for this survey. The information you tell us will be confidential and anonymous. We will not collect your name or other identifying information.

- ○ **I give permission for my anonymous answers to be included in publications resulting from this study**

How old are you?

[ ]

***Are you already active in crisis response, in one way or another?**

- ○ Yes
- ○ No

***Have you or loved ones ever been affected by a major crisis?**
(A major crisis can range from natural disasters to political turmoil)

- ○ Yes
- ○ No

***If you wanted to help a community that had been struck by a major crisis (such as a hurricane), which would you be more likely to donate: your money or your time?**

- ○ Time
- ○ Money
- ○ Both
- ○ Neither

Online Volunteer Survey

Have you volunteered in person in any way in the last year?

- Yes
- No

If yes, what are some of the ways you have volunteered in person?

***Have you ever volunteered over the web?**
(This could include donating your skills pro bono, or otherwise assisting a person or group over the internet)

- Yes
- No

If yes, how have you volunteered online?

***If you wanted to help, do you feel you have skills or services you could provide to a community in need?**

- Yes
- No

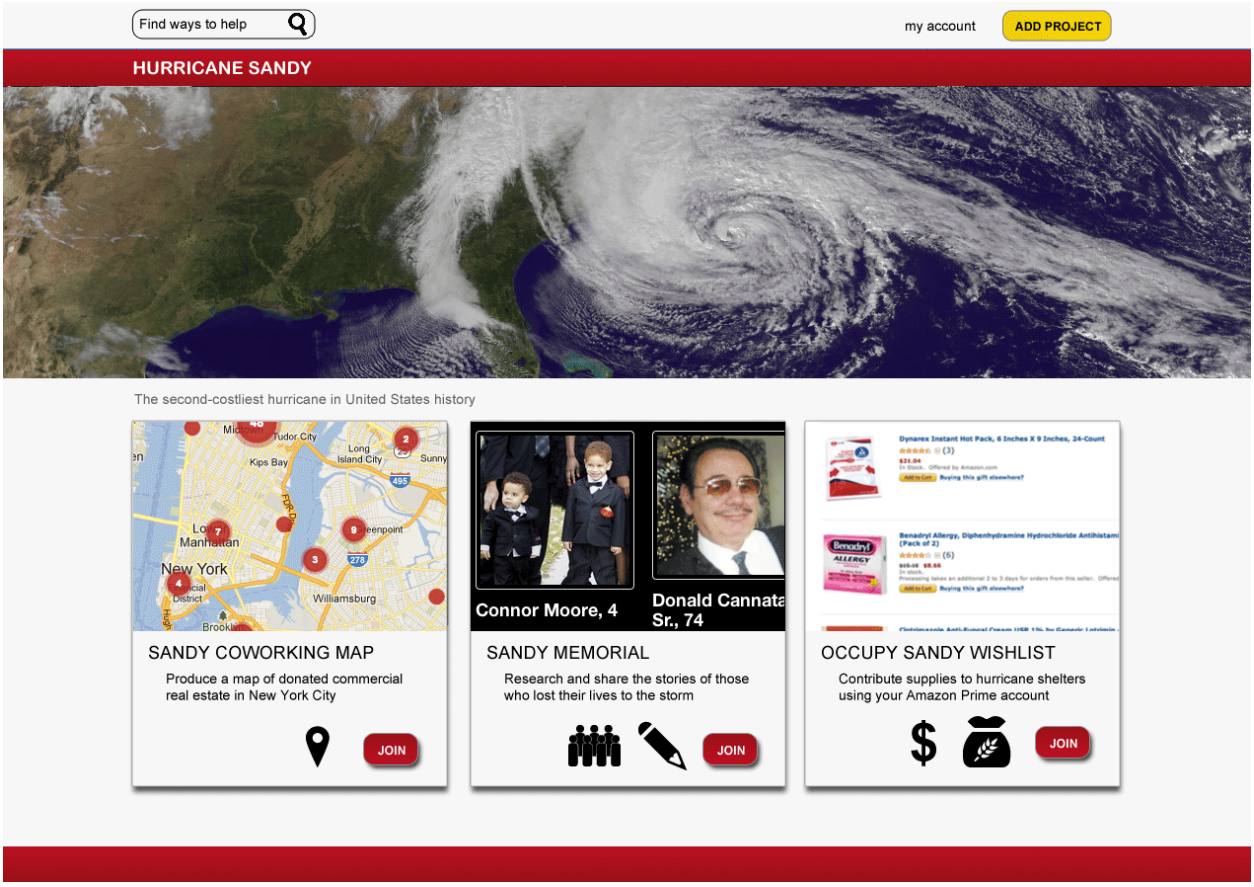
***Do you have a clear sense of where you would go to provide your skills or services in a time of crisis?**

- Yes
- No

*Please rate your comfort level with technology

	Strongly disagree	Disagree	Slightly disagree	Not sure	Slightly agree	Agree	Strongly agree
I consider myself very comfortable with digital technology	○	○	○	○	○	○	○

On the next two pages, you will be shown samples from a website listing online volunteer projects. Please examine them. You will then be asked about your reactions on the final page.


Find ways to help
my account
ADD PROJECT
HURRICANE SANDY
The second-costliest hurricane in United States history
Tudor City
Long Island City
Kips Bay
Sunny
Manhattan
New York
Williamsburg
Connor Moore, 4
Donald Cannata Sr., 74
SANDY COWORKING MAP
Produce a map of donated commercial real estate in New York City
JOIN
SANDY MEMORIAL
Research and share the stories of those who lost their lives to the storm
JOIN
OCCUPY SANDY WISHLIST
Contribute supplies to hurricane shelters using your Amazon Prime account
JOIN

Find ways to help

my account ADD PROJECT

ABOUT YOU

your skills

Tell us some of the ways you can help

- Legal assistance
- Technical support
- Mapping
- Data management
- Visual work
- Get the message out
- Organizational support
- Fundraising
- Social media
- Volunteer coordination
- Writing and storytelling
- Human needs
- Statistical analysis
- Advocacy
- Monitor media
- Data entry
- Translation
- Trained responder
- Software development
- Creative solutions

Import your LinkedIn endorsements

- 3 Interaction Design
- 3 Visual Design
- 3 Wireframes
- 2 Social Media Growth
- 2 Storyboarding
- 2 User Interface Design
- 1 Retail Display

import

Online Volunteer Survey

Now that you've seen our prototypes, we'd love to know what you think.

* **If you wanted to help a community that had been struck by a major crisis (such as a hurricane), would you be more likely to donate your money or your time?**

- ○ Time
- ○ Money
- ○ Both
- ○ Neither

* **If you wanted to help, do you feel you have skills or services you could provide to a community in need?**

- ○ Yes
- ○ No

Would a project marketplace like the pages you saw help you find volunteer projects?

- ○ Yes
- ○ No

Say more?

* Could you see yourself referring to a website like this one to offer your skills, services, or time to a community in need?

- ○ Yes, I would check the projects here to see if I could help
- ○ No, I would provide help another way

Why or why not?

* **If this marketplace of volunteer projects were available today, how likely would you be to use it to help respond to a crisis like a hurricane?**

- ○ Extremely likely
- ○ Very likely
- ○ Moderately likely
- ○ Slightly likely
- ○ Not at all likely

Online Volunteer Survey

***If this website were available today, how likely would you be to recommend it to others looking to help?**

- ○ Extremely likely
- ○ Very likely
- ○ Moderately likely
- ○ Slightly likely
- ○ Not at all likely

What would make you more likely to use this volunteer project marketplace?

Who are you likely to contact to offer your help during a crisis?

- ☐ Formal aid organization (like the Red Cross or FEMA)
- ☐ An online volunteering project (like CrisisMappers)
- ☐ People in the affected community themselves

Online Volunteer Survey

Thank you so very, very much for taking the time to fill out this survey.

To thank you for your time, here's the promised collection:
81 Ways YOU Can Help a Community in Crisis.

An analysis of the aggregated results of this survey will be published in the weeks ahead at http://mattstempeck.com. You can reach me at stempeck@mit.edu at any time with questions or comments.