Independent Evaluation of the Ushahidi Haiti Project

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DISI – Development Information Systems International
Ushahidi Haiti Project

Table of Contents

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Acronyms

AEA	American Evaluation Society
DISI	Development Information Services International
EIS	Emergency Information System
GPS	Global Positioning System
ICRC	International Committee of the Red Cross
IFRC	International Federation of Red Cross and Red Crescent Societies
NGO	Non-governmental Organization
OCHA	United Nations Office for the Coordination of Humanitarian Affairs
PaP	Port au Prince
SMS	Short Message Service
UHP	Ushahidi Haiti Project
UN	United Nations
USAID	United States Agency for International Development
USCG	United States Coast Guard
USMC	United States Marine Corps
WFP	World Food Programme

Executive Summary

The Ushahidi Haiti Project (UHP) was a volunteer-driven effort to produce a crisis map after the January 12, 2010 earthquake in Haiti. The project represents an impressive proof of concept for the application of crisis mapping and crowdsourcing to large scale catastrophes and a novel approach to the rapidly evolving field of crisis informatics. This evaluation was commissioned by the student group at the Tufts University Fletcher School who instrumental in the UHP deployment and is intended to be a *learning evaluation* as opposed to an *accountability evaluation*. The evaluation's purpose is to serve the needs of UHP users and was structured around the Organization of Economic Development's (OECD) criteria: relevance, effectiveness, efficiency, impact and sustainability. The evaluation team utilized a mixed methods approach combining surveys of key user and volunteer groups, 30 interviews with core UHP volunteer staff and stakeholders, document review/data analysis primarily focused on UHP message data, volunteer chat forums, coordination chat history and key news sources/blogs.

Relevance

To what extent does UHP address unmet needs of beneficiaries, humanitarians and the donor system which supports it?

Looking at the relevance of a project gets at the heart of whether or not it was a good idea from the start. The enormous appeal of the UHP in the media and among stakeholders can be largely attributed to its profound relevance in early response to emergencies. The UHP addressed key information gaps (1) in the very early period of the response during the first days and weeks post-quake before UN and other large organizations were operational, (2) by providing situational awareness and critical early information with a relatively high degree of geographic precision, (3) by providing situational information for smaller NGOs that did not have a field presence in Haiti, (4) by helping smaller, privately funded responses to more appropriately target needs and, (5) by facilitating private citizen actors. The UHP also was relevant in the sense that it directly engaged affected Haitians and the Haitian Diaspora in the articulation of need and the organization of local capacity for response. Vigilant attention to broad concerns related to the protection of participants and vulnerable individuals is key to maintaining and improving relevance to the willing participants in open, social crisis mapping systems such as UHP.

Effectiveness

To what extent did responders actually make decisions based upon UHP and the information it provided?

The question of information use is central to the evaluation of information interventions. However, the linkage between information and response in general is typically tenuous at best, and the evaluators were not surprised that findings regarding such linkages were mixed.

Perhaps the most common use of information aggregated by UHP was for situational awareness. The Department of State analysts for the USG interagency task force used Ushahidi in at least one case to help triangulate conclusions about the situation on the ground, and US military organizations used Ushahidi data feeds along with other sources in a similar manner to inform their early situational assessments. There is also some evidence of the information being used for specific operational and tactical actions targeting specific communities (and to a much lesser extent, individuals). US marines used the information to identify "centers of gravity" for deployment of field teams to areas of need, for example. Likewise, small privately-funded nonprofits without prior field presence in Haiti used the information to identify institutions such as orphanages or hospitals as possible partners. For example, the organization NYC Medics were able to identify the Albert Schweizer Hosptial as an institution with capacity to use the doctors and supplies that the organization was able to mobilize. There is also evidence that the volunteer geo-location services offered by the UHP core team were useful for SAR efforts, for example through the resourceful geo-coding efforts of Anna Schultz at Tufts, among others. This team

and its volunteer leadership, like Patrick Meier, were also effective in recognizing and catalyzing linkages and collaborations with other key systems and networks such as Mission 4636, Crowdflower, and OpenStreetMap which collectively added tremendous value to the overall stream of crisis information.

There is less evidence in the data sources reviewed by evaluators that the UHP web application itself was used extensively for soliciting additional information and feedback on individual reports, or status tracking and the monitoring of individual incidents over time, though this was indeed happening through volunteer efforts to some extent.

Why was the information used?

The UHP information was used primarily because it was the only map aggregator of information coming from the affected area during the early days after the quake. Again, this is a testament to the high degree of relevance of the UHP project. The credibility of the project and project team was often cited as a reason for the continued use of the information, and high levels of trust built through common graduate academic programs and pre-existing professional networks such as the International Network of Crisis Mappers cannot be underestimated.

Why was the information NOT used?

Barriers to use of the UHP were often significant, if also largely unsurprising. Primary among these barriers was a general inconsistency of the dynamic "event data" aggregated and syndicated by UHP with the specific and often relatively rigid information requirements of traditional responding organizations which typically require certain types of information at certain times and organized around certain response sectors and geographies. The UHP team indeed made efforts to adapt to these requirements but it is still cited as a significant obstacle to use throughout the early response. Information overload remains an issue in general for these responders.

Use was also limited due to apparent low awareness of the project within the humanitarian community in Haiti, along with low knowledge of and capacity to use the crowdsourced information. While a clear strength of the UHP was its healthy cooperative relationship with other crisis informatics initiatives like Mission 4636, it is likely that this may have also obscured a distinct UHP "corporate identity," and thereby negatively impacted awareness among groups of potential users initially less familiar with Ushahidi. Interviews also revealed some general "suspicion of the crowd" and related questions about the representativeness and quality of the data.

Finally, there were several technological limitations to information use. USG staff cited outdated computers, browsers as well as internet communication security policy as significant obstacles to accessing the UHP website and data streams. Limited bandwidth was cited by organizations on the ground in Haiti.

Efficiency

How efficiently did UHP add value through the processing and mapping of reports?

Estimates of 40,000 to 60,000 reports were processed through UHP/Mission 4636, and 3,584 events have been mapped in Haiti. Of these, 80% were mapped in the first month and 72% of all points were mapped in Greater PaP.

UHP leveraged some tremendously efficient crowdsourcing strategies to map a translated and geo-coded stream of data, namely the crowdsourced mapping of Haiti using the OpenStreetMap and the crowdsourced translation of Mission 4636 text messages that was eventually connected to the volunteers of UHP with the support of CrowdFlower. Open Street Map and Mission 4636 created improved open source maps and translated messages respectively, and UHP relied heavily on these innovations as primary sources of information behind the UHP site's dynamic map. The translation and geo-coding of messages in preparation for reporting in and of itself was fast, though there is evidence that there were occasional delays between steps in the system and the ultimate mapping of reports. Often the message detail was not sufficient to correspond to specific relief planning needs related to the number of people in need and their location. Duplicate messages indicated some technical or systemic problems that were not corrected by quality assurance efforts. At certain phases, uneven capacity of volunteers and insufficient efforts to build consistent capacity or implement more rigorous quality assurance also negatively impacted the value of classification and in some cases the accuracy of locations. Although there were some

concerns expressed by both volunteers and potential users about the accuracy of geo-coding, the majority of incident reports did not require search and rescue action and therefore high accuracy and precision was actually less critical. Additional consideration of appropriate geographical aggregation for different types of reports may have improved the usefulness of information from UHP.

Efforts in the area of categorization and sub-categorization did not represent significant value added. This was partly a result of the classification scheme and also sometimes due to a significant rate of mis-classification in some categories (as high as 47%). A surprising finding was that volunteers sometimes intentionally misclassified general distress messages as a request for food or water because of a concern that messages not associated with a specific classified need might be ignored. Lack of clear criteria and robust classes contributed to these types of misclassifications.

Impact

To what extent did UHP benefit people affected by the earthquake?

It must be noted that this is the most difficult aspect of the UHP to assess and this section of the evaluation is supported with the weakest evidence base. It was abundantly clear in the interviews that stakeholders strongly believe lives were saved as a result of UHP. For instance, many of those interviewed offered the case of the rescue of a trapped UN worker. The evaluation team reviewed the UHP site data base, Skype chat logs and relevant news and websites to assemble evidence that information was acted upon resulting in saved lives or livelihood-saving outcomes. A survey of Haitian Diaspora and the Mission 4636 volunteer community also was conducted, though the response rate was very low. The evidence base tying UHP to actual beneficiary outcomes was very limited. This cannot be interpreted as lack of impact, as data sources available to the evaluators were not sufficient to accurately measure impact.

Sustainability

To what extent has the UHP created a group of international crisis mappers?

At an international level, the UHP experience has propelled crisis mapping and the International Network of Crisis Mappers to a larger response community and has resulted in dramatic growth in the crisis mapping community. Furthermore, evidence of sustainability can also be found in the deployment of similar but improved crisis mapping activities in more recent disasters such as the quake in Chile and floods in Pakistan later in 2010. The sustainability of the crisis mapping community is also enhanced by the strong links that Ushahidi and the crisis mappers have established with academia, and it should also be noted that a Standby Volunteer Task Force was launched at the International Conference on Crisis mapping (ICCM) 2010 precisely to aid in sustainability and preparedness.

To what extent has UHP been institutionalized in Haiti?

In Haiti, the UHP has made a great effort to transition the work they started, and continue to be a resource to the emergency response community there. A Haitian partner, Solutions, was identified that had been developing a similar mapping capability in parallel. The UHP team assisted in development of their own crisis mapping platform and assisted with introducing the site called Noula.ht to the humanitarian community, as the UHP team built up partnerships and networks during their operations on the ground. Additionally, a microtasking NGO called Samasource that focuses on providing jobs in poor and disaster-affected communities through microtasking had begun work in Haiti before the earthquake. They have been working to create a capacity to translate and geolocate messages for Noula.ht from a center near PaP. Additionally, several UHP volunteers are now working in different capacities in Haiti.

To what extent has UHP stimulated commitment from donors and influential actors?

UHP's impact on donor/influential actor commitment was substantial, as indicated in press releases as well as continued engagement of the UHP team. For example, interviews with several respondents working with the military attribute UHP as being critical for the breakthrough in executive level demand for crowdsourced data, crisis mapping and the creative engagement of mobile and social media.

Highlighted Recommendations

Following is a selection of key recommendations from the larger evaluation report. It should be noted that some of the recommendations—in particular those related to training and preparedness of volunteers

and academic institutions--have begun to be addressed through the recent establishment of the Standby Volunteer Task Force at ICCM 2010 and the Universities for Ushahidi Initiative.

- Seek crisis mapping champions among UN, NGO and influential responding organizations. Target capacity building opportunities at these institutions. Pay special attention to coalitions of small and medium-sized NGOs that may benefit most from these UHP-style approaches. Consider intentional outreach to community-based and faith-based organizations that tend to have long-standing relationships with vulnerable populations and effective communication networks at local level.
- Strengthen connection with Academia, particularly for university-based deployments of Ushahidi. Get faculty involved in the recruiting, training, and develop a Certificate in Crisis Mapping.
- Engage more closely with the UN Cluster Information management group and CDAC, potentially taking a survey approach to shaping the characteristics (metadata, format, type, visualization) of data aggregation, classification, mapping and visualization.
- Develop capacity building tools for volunteer and community-based organizations, as well as citizen responders, including sensitization to issues such as protection. For capacity building, consider partnering with small firms already working in developing countries or vulnerable places that have experience consulting for the international community and government using GIS and mapping for development or recovery activities.
- Strengthen ties to CDAC and emphasize early identification of respected authorities and communications channels to improve reporting frequency (by responders). Ensure that reporting channels are unambiguous and clear in purpose and use.
- Identify institutional partners for geo-location reach-back for SAR and also for reliable case management of urgent reports such as "trapped people" or "medical emergencies"
- Improve information utility by increasing the diversity and sophistication of intelligent summary tools and syndication options.
- Implement more rigorous quality assurance techniques to monitor accuracy of classifications and geo-location in near real-time. Spend time developing classifications in cooperation with experienced emergency responders that understand operation decision making in emergency response. This learning should contribute to the continuous improvement of capacity building materials, standards, and volunteer competency.
- Continue to strengthen tools for incident tracking/monitoring, potentially leveraging existing major social networks and communication tools to rapidly jumpstart collaboration in this area following a disaster event. Clearly documenting the source of the reports and source of the comments would aid immensely in understanding impact of the activity.

1 Introduction and Methods

The Ushahidi Haiti Project (UHP) was a volunteer effort to produce a crisis map after the earthquake centered near Port au Prince (PaP) on January 12th 2010. Information about the humanitarian crisis and the response that followed was mapped in near real time by volunteers from a variety of sources including: SMS, Web, Email, Radio, Phone, Twitter, Facebook, Television, List-serves, Live streams, Situation Reports[1].

An evaluation of the volunteer effort was commissioned by a student group instrumental in the Ushahidi Haiti deployment. The purpose of the evaluation is to inform future crisis mapping efforts. Given the novelty of the Ushahidi Haiti Project (UHP), the evaluation design and methods also were novel and dynamic, reflecting a developmental evaluation approach. A 'user focus' was requested for the evaluation, and the team conducted a series of preliminary interviews with primary stakeholders to properly scope the evaluation so that it would answer the most pertinent questions for future crisis mapping implementations. The evaluation strategy and methods were adapted over time to accommodate new learning and unanticipated obstacles to the evaluation[2].

The evaluation was organized around the Organization of Economic Development's (OECD) criteria: effectiveness, efficiency, impact, sustainability and relevance in response to the Terms of Reference (TORs) for the evaluation. Evaluation results are presented for each of these criteria. From the start, the evaluation focused more heavily on the areas of relevance, effectiveness and efficiency due to the difficulties/costs associated with conducting impact evaluation. However, all aspects of program performance are analyzed and reported here.

What this evaluation does not cover

The UHP was implemented amidst a network of interrelated information initiatives. Several of these activities made critical contributions to and use of the crisis information organized by UHP. It is not within the scope of this evaluation to evaluate these activities individually or at the network level.

Mission 4636 is a good example of a collaborative activity. This evaluation touches on the collaboration between UHP and Mission 4636, but this work does not constitute an evaluation of Mission 4636.

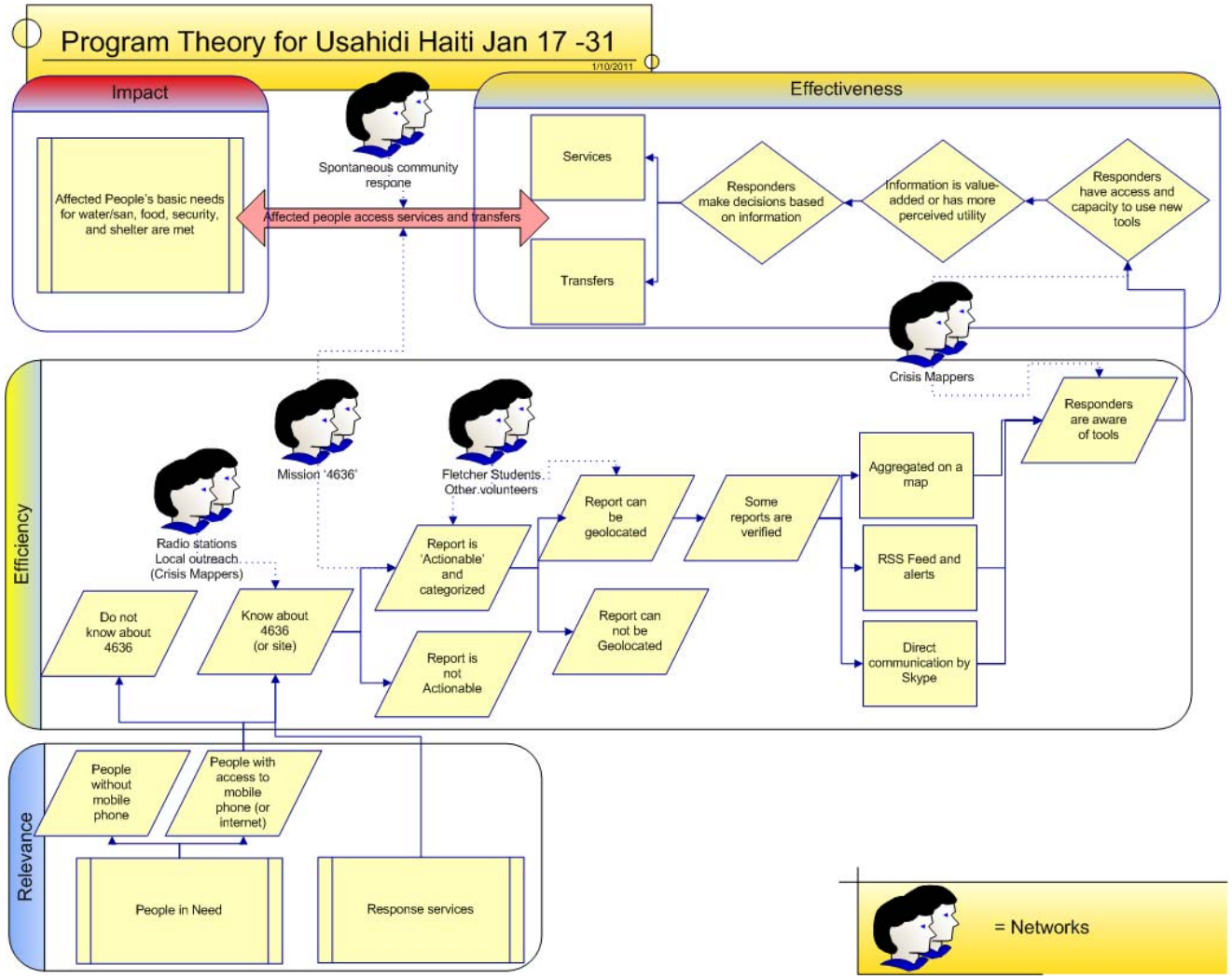
As in many cases of information/communication technology interventions, program change models are implicit, rather than explicit. But the basic theory postulates that application of these new technologies will result in superior and more real-time information for use in humanitarian response and that responders will actually use this information to better manage resources that will translate in to life and livelihood saving humanitarian interventions. The first step in any evaluation is to develop these evaluation change hypotheses and the program theory model that reflect these.

Identifying the elements of the "intervention" is a first step in this process. In the case of the Ushahidi Haiti Project, defining the intervention was not a trivial exercise. Different stakeholders had varying perspectives on what the UHP actually was and, as a dynamic intervention, UHP changed over time. The fact that the UHP was not developed with an initial plan beyond the simple mapping of potentially relevant information, but rather took shape rapidly and organically in response to a sudden onset crisis presented the evaluation team with certain methodological challenges in using the OECD criteria in the evaluation. The lack of a log frame requires that the program logic be reconstructed based on the preliminary interviews and available documentation. As shown above, the evaluation criteria are based on the ability to examine the processes and assumptions that link the hierarchy of objectives.

[1] http://haiti.ushahidi.com/page/index/1

[2] Logistical challenges in Haiti, limited availability of many humanitarians to be interviewed, low response rates on internet surveys and the Institutional Review Board human subjects protection review slowed the progress of the evaluation and called for adaptations from the original planned methodology. In addition, as the evaluation process unfolded, the evaluators encountered new findings that required additional explanation/interviews.

In order to structure the evaluation matrix by the evaluation criteria, the evaluation team utilized the following Program theory presented in Diagram 1.


Program Theory for Usahidi Haiti Jan 17 -31
1/10/2011
Impact
Affected People's basic needs for water/san, food, security, and shelter are met
Spontaneous community respone
Affected people access services and transfers
Effectiveness
Services
Transfers
Responders make decisions based on information
Information is value-added or has more perceived utility
Responders have access and capacity to use new tools
Crisis Mappers
Responders are aware of tools
Efficiency
Mission '4636'
Fletcher Students, Other volunteers
Radio stations Local outreach (Crisis Mappers)
Report is 'Actionable' and categorized
Report can be geolocated
Some reports are verified
Aggregated on a map
RSS Feed and alerts
Direct communication by Skype
Do not know about 4636
Know about 4636 (or site)
Report is not Actionable
Report can not be Geolocated
Relevance
People without mobile phone
People with access to mobile phone (or internet)
People in Need
Response services
= Networks

Evaluation questions were developed for the five criteria. Interview instruments captured aspects of this information targeted to key stakeholder groups. There were semi-structure interview instruments for:

- UHP, Mission 4636 volunteers, and other people knowledgeable about UHP
- Emergency responders and staff of organizations involved with response

People to be interviewed were suggested by the primary stakeholders. The evaluation team interviewed 30+.

Because many of the people involved with UHP were only connected to networks that primarily exchanged information over the internet, a social media strategy to cast a wider net of possible users or contributors to UHP was developed. Information and key documents from the evaluation were posted on a Facebook site and made available for download from Google Docs. Blog posts announced the evaluation. For a brief time, several tweets about interviews or progress of the evaluation were shared over Twitter. Although response rates were low, questionnaires for the following groups were returned:

- Emergency responding actors and agencies
- Crisis Mappers Network
- Volunteers to Mission 4636

Document review largely consisted of an analysis of a database of more than 3500 reports available from the UHP site. Basic timelines and metrics were created from messages. The unstructured nature of the data necessitated extensive manual review of data. Timelines and maps as well as the reports themselves were used to triangulate statements made in interviews or surveys. Over 800 pages of Skype chats also were reviewed. In the end, the evaluation is organized around 8 'big questions' that could be answered by the evaluation with the methods and resources agreed upon with the evaluation stakeholders. These questions are:

- **In what innovative ways did UHP complement traditional humanitarian information systems and include needs as expressed by affected people?**
- **To what extent do UHP activities adhere to norms and standards of Humanitarian response?**
- **Did responders make decisions based on information provided by the Ushahidi Haiti Project?**
- **How were people using '4636' number to report needs?**
- **What was the value-added of UHP volunteers classifying and geo-locating the messages?**
- **To what extent has the Ushahidi Haiti Project contributed to the growth of a network of International Crisis Mappers ?**
- **Did UHP activities contribute to saving lives or meeting basic needs of affected people?**
- **To what extent has the Ushahidi Haiti Project informed the emergency response community about crisis mapping?**

2 Relevance

Relevance is one of the most important qualities of a novel intervention; evaluation questions focus on determining whether the intervention as conceived actually addresses unmet needs of beneficiaries, humanitarians and the donor system that supports them. Relevance gets at the heart of concept and design of intervention. Is the idea a good one?

The enormous appeal of UHP, which has received great applause by media and many stakeholders, is the profound relevance of the crisis mapping concept to early response to catastrophic emergencies. Donor executives, analysts, citizens and beneficiaries "get" the importance of near real-time georeferenced information shared among affected populations and potential responders around the world.

UHP filled information gaps:

- in the very early response – during the first days and weeks, before UN and large organizations are operational. This is a way to direct improvisational activities, to get resources to people in need in new and innovative ways.
- by providing situational information for small NGOs that do not have field presence.
- by helping small private funded responses to target needs – mostly aimed at institutions.
- by facilitating private citizen actors.
- by providing situational awareness and critical early information. UHP provided geographic precision that is lacking in other situational awareness tools available to the public.

Relevance – adherence to Humanitarian policies, procedures and practice as reflected in the dual priorities of participation and protection

Participation

UHP's relevance is reflected in its furtherance of six of the ten articles of the Red Cross/Red Crescent's code of conduct. Perhaps the most obvious is principal seven, "Ways shall be found to involve programme beneficiaries in the management of relief aid". Accurate and representative assessment of need is central to the concept of impartiality and makes the UHP activities relevant to article 2, "Aid is given regardless of the race, creed or nationality of the recipients and without adverse distinction of any kind. Aid priorities are calculated on the basis of need alone". UHP did provide a unique source of information on local capacities and is therefore relevant to principal six, "We shall attempt to build disaster response on local capacities." UHP may represent a new and uniquely relevant way for the international humanitarian response community to respect affected people as described in principal ten, "In our information, publicity and advertizing activities, we shall recognize disaster victims as dignified human beings, not hopeless objects" and principal five "We shall respect culture and custom."."

Protection

Protection of the affected population is a concern in any emergency response and has been identified as a general risk associated with the use of social media. UHP initially provided publically accessible information that might have compromised protection of vulnerable groups. While UHP corrected this deficiency in subsequent postings, the broader protection concern is a continuing constraint to free and open sharing of information about needs of vulnerable individuals.

3 Effectiveness

Did responders make decisions based on information provided by the Ushahidi Haiti Project?

The evaluation's effectiveness questions focused on whether, how, by whom and for what UHP information was actually used to directly or indirectly respond to the massive emergency. The question of information use is central to information interventions; however, the linkage typically is tenuous at best. The evaluators were not surprised that the findings linking UHP to response were mixed. This assessment of information use doesn't capture accurately the extent of use because of the nature of this data source; it is open, publically available and not tied to a specific response organization or network of organizations. As such, estimating the extent of UHP information use is challenging. This evaluation team triangulated available information sources to identify the types of verified information uses.

The evaluation team identified four distinct uses of UHP information. Perhaps the most common use was in support of situational awareness for strategic, operational and tactical organizations. Ushahidi was integrated together with other sources of information to develop an assessment of the situation on the ground. The evaluation found evidence that even executives such as the United States Secretary of State endorsed the use of Ushahidi for this purpose. The Department of State analysts for the USG interagency task force used Ushahidi as one of these sources to triangulate conclusions about the situation on the ground. Similarly, the US military organizations that had tactical missions on the ground early during the response apparently utilized information from UHP as evidenced by interviews and analysis of UHP chat logs. As the marine contractor analyst based at Quantico, Virginia states: "My job and mission set is to use open source data for intelligence, [you might] never believe that Marine corps response would be driven by Facebook, Twitter, Blogs, Flicker, and Ushahidi, but this one was". Headquarters incorporated UHP information in to their situation reports on a regular basis during the first several days of the response and pushed this information forward to field units and the field based command focal point. The evaluators also found evidence that the US Coast Guard used information from Ushahidi feeds along with other sources to inform their early assessments of the situation on the ground.

The evaluators also found evidence that specific operational and tactical actions were informed by Ushahidi in the targeting of efforts to communities, institutions and to a much lesser extent individuals (USAR type application). This occurred particularly among organizations that engaged in Haiti without pre-existing field knowledge/presence. The US Marines were most prominent among the USG actors. Their analysts used UHP information to identify "centers of gravity" for deployment of field teams to areas of need, for example. The Marine Corps analyst was adept at utilizing less structured social media. He used UHP information for identifying specific geographic areas of need as well as, in some cases, institutions requiring assistance.

The evaluation found evidence that small privately funded non-profit organizations and individual citizen responders without field presence also used UHP information for specific operational/ tactical decisions. The organization NYC Medics, for example, identified Albert Schweitzer Hospital as an institution with capacity but need of physicians. A Canadian woman turned humanitarian actor after the Earthquake was able to activate a novel initial response based upon UHP information that led her to develop a network of Haitian field operators that distributed relief supplies during the first few days after the earthquake (before large organizations were operational). A similar use was reported by a US-based analyst supporting an American Medical School's attempt to effectively engage in Haiti.

	Situational Awareness	Targeting humanitarian efforts	Identifying Resources	Geolocation	
US Marines	X	X			
USCG	X	X			
State Department	X				
SouthCom Taskforce	X			X	
University of South Alabama Supporting Medical School in Haiti	X				
NYC Doctors	X	X			
Melissa Elliott	X	X	X		
UNDAC SAR				X	

Finally, the evaluation team found evidence that UHP geo-location services were used early during the response in support of USARs in very specific ways. Interviews underlined the important nature of reach-back for geo-locations for teams involved in search and rescue. In the first few days of the response, the Ushahidi Haiti Project had a direct liaison with the UNDAC SAR tent through INSTEDD staff who shared information that was "hand carried on little slips of paper back and forth between tents".

The first example is from an email message on the evening of January 18th and gives an idea of the places that the SAR dispatch was to inform SAR missions being fielded on the morning of the 19th:

> "You get what we get. This is all we know:
>
> 1. Delmas 42, at 12 Rue Pincon
> 2. French Embassy (apparently 17 people alive)
> 3. Hotel Montana
> 4. 310 Avenue John Brown
> 5. Un Bon Prix, near Napley Inn Hotel
> 6. Rue Saint-Gerard, Carrefour, Feuilles
> 7. Sky-Net cyber cafe across from Nouveau College Bird between Rue Casernes (also called Rue Paul VI) and Rue de L'Enterrement,
>
> Date: Sun, 17 Jan 2010 21:02:04 -0400

One of the most important things to remember about reach-back geo-location and SAR activities is that they are only valuable for a short period of time. The reach-back for coordinates began for missions on the 19th and the departure letter about the accomplishments from Eric Rasmussen was sent on the 23rd. Geo-location is an important but punctual requirement and relied heavily upon one talented volunteer.

The UHP also was instrumental as a part of the Mission 4636 project in stimulating the development of informal networks, particularly among Haitian affected persons and Diaspora, that became direct users of SMS messages. While the evaluation has not yet completed its assessment of engagement of this stakeholder group, initial surveys suggest that Diaspora directly contacted affected individuals/households and also connected them with local resources. The final evaluation report will contain greater detail regarding the extent of this aspect of the response.

In addition to the use of UHP data streams described above, the Ushahidi web application was designed with some capacity to function as a collaborative forum for monitoring incident status and incident-specific information over time. Commenting features and the addition of an "Action Taken" tag to the system, for example, enable this. It does appear that these features were utilized primarily by a small number of individuals (Table 1). When comments and feedback were indeed provided for incidents there is some documentation of the closure of the information feedback loop, for example when a messaged texted to 4636 was met with a response on the ground, when a reported missing person was found or when a report of resource availability was corroborated and detailed. However, the Ushahidi web application features intended to receive and organize comments and feedback on incidents appear to have been largely under-utilized by the network of users, responders and volunteers. It is likely that more information on incident status was exchanged using other networks and technologies such as Skype and Twitter.

Table 1. Commenting Activity on the Ushahidi Haiti Site

Total number of comments on the Ushahidi Haiti site	207
Percentage of all incident reports with comment activity	3.39%
Number of unique commenters (number of unique commenter email addresses)	134 (136)
Percentage of commenters contributing only once	77.60%
Percentage of all comments contributed by top 10 commenters	27.50%

Why was UHP information used??

UHP information was used because it was the only map aggregator of information coming from the affected area during the early days after the earthquake. Its rapid deployment generated great interest by the media and senior donor decision-makers. Visualization was a key aspect. The clustering of reports on the map closely matched the mandate of the Marines to identify centers of gravity. Another interviewee remarked that the clustering on the maps was "beautiful".

The continued use of UHP is largely credited to its credibility. Several sources cited the connection with academia as important to the legitimacy of UHP. Others had met Patrick Meier through professional conferences and had great confidence in his leadership specifically "I respect Patrick a lot, I think the stuff he does some of the smartest stuff out there". This is also true of the trust and use of Anna Schulz's geo-locations. There was a well connected observer that visited the UHP situation room early in the response and it was the personal endorsement of her work that encouraged the reach-back for locating coordinates for the SAR missions.

The role of pre-existing networks for information demand creation cannot be understated. There is a clear connection between involvement in the academic networks and use of UHP information. Graduate programs are leadership machines, producing networks of professionals who rely on their graduate institutions and peers to identify best practices in their professional fields. The network has been strengthened by the International Crisis Mappers Network that has extended and connected these networks to humanitarian leaders in 2009 and 2010. Within the group there seems to be a good deal of mutual admiration and trust, and this leads to high

levels of confidence in the approaches and quality of the information. Networks build awareness, inform about the nature of the technology, and also create personal trust and linkages that seems to be the key element of use.

Why was UHP information not used?

The most important reasons identified for not using or under-using UHP information are the following:

1. Lack of sufficient awareness/knowledge and capacity of humanitarian community
2. Identity issues related to the novelty of the innovation, its dynamic networking nature and lack of a "corporate identity" strategy
3. Inconsistency of event data of this nature with more specific operational needs of traditional humanitarian players
4. Stakeholder technology constraints
5. Credibility related to the nature of the information and organization

Before the earthquake response in Haiti, the possibility of using Ushahidi maps for emergency response was not well-known among the response community. This is not surprising as the approach and technology is relatively new. Even after initial media reports that included high-level endorsements, many traditional humanitarian actors on the ground or in headquarters offices were not aware of UHP or were only vaguely aware of its existence. "The idea that everyone was talking about Ushahidi [in the response community] was simply not true" according to an expert that has done extensive research on traditional and social media in Haiti. Interviews with UN cluster leads, US government officials, and other responders confirmed that much of the traditional humanitarian community was not sufficiently familiar with the UHP to use it. .

Haitians and the Government of Haiti were not initially aware of UHP either. This was due not only to its relative novelty but also to identity issues related to the project. UHP was so focused on field priorities that its identity to the public was often unclear, was it Mission 4636, a 911 call center, or a map aggregator? In some sense, the strength of the UHP was also a weakness. Its effectiveness was enhanced through the tremendous networks that it leveraged; however, its face to the public was weakened by its ambiguous identity.

The traditional humanitarian community, especially the components that work after SAR has diminished, operates on standard operating procedures using structured indicator data. Large traditional emergency responders rely on response plans and long-standing protocols. There is some rigidity in the system that expects information in specific formats at specific times to inform these response plans. When pushed on why UHP was asked to make products that were not used by WFP, a senior staff member mentioned, "we have enough trouble making use of the information that we do have for our response plans". One of the most experienced emergency responders interviewed in the evaluation described UHP as "a shadow operation that was not part of the emergency response plan".

For example, large scale food distributions, like most of the major distribution activities that make up the bulk of emergency response, do not make punctual response to a specific person in a specific location like SAR activities. Security and logistical concerns dictate response plans to meet aggregate need. Following this traditional response logic, central distribution points were set-up around PaP. Their planning did not seem to require the type of event information that UHP was providing. As a US government official explained, "so much is done by standard operating procedure – staying in your comfort zone".

Private voluntary organizations and non-governmental organizations perform most of the day-to-day response activities in emergencies. Most of this activity is coordinated through the UN

cluster system and this is where most of the response actors agree on the level and magnitude of need. They also decide their area of intervention and request resources from common appeals. As a staff member of a large international NGO put it, "emergency responders do not have time to read blogs. It must go through the cluster system to be useful".

Sectors of intervention have a large influence on the information needs of different response actors. Most funding is tied to a sector and most NGOs specialize in one of the activities represented by the UN clusters. In interviews, the connection to information needs of specific sectors was also underlined as a pre-condition for use of information.

All the people involved in actual response activities and those that have had operational experience spoke of the issue of information overload in recent emergencies including Haiti. Those with less experience in using social media data viewed the UHP as contributing to this problem: "There was a lot of information. Not sure they could sort through all the messages".

Some stakeholders felt that dynamic information was particularly needed in the areas of security and logistics which were not as well reported in the UHP data base. A Marine's analyst talked about useful information as knowing if a bridge is out, then they could make an amphibious landing. He summed up their information needs as "Marines very interested in safety issues. Transportation safety on the roads." Officials and others also reaffirmed that UHP was not as good at picking up security information as they had hoped and that they needed for their decisions.

Technologies used by UHP were another major barrier to use of UHP products for some organizations. US Government staff based in Washington DC said that they only had access to computers with a very early version of Internet Explorer (2.0). This browser was unable to render the Ushahidi site. It was also noted in several other interviews that anyone working in an organization requiring security clearance cannot use personal electronics like mobile phones. They are restricted on the use of Skype or RSS feeds, and often experience the same problem of outdated browsers.

Operational responders have limitations primarily with internet connectivity. The bandwidth on the ships supporting the Marine missions was described as a "soda straw". It is clear that most emergency responders have some technical difficulty with access whether it is policy, hardware, software, or connectivity – this will continue to be a barrier to the use of information product like those provided by UHP.

Even as credibility can be cited as a primary motivation for use of the Ushahidi data stream for some users, in the context of all the other constraints indeterminate credibility was given as the most common reason why an organization would not use the information made available by UHP for decision making even if they knew about it. Among sophisticated users of information, individual report accuracy was threatened by the psychological state of those reporting, specific accuracy of geolocation and bias related to who has the capacity to report. Among others less familiar with UHP, lack of use was related to unfamiliarity with source and technologies. As one NGO leader said, "You need to face it -- people will not use it if they do not trust it --if they do not believe it." The response community often is characterized as being a tightly bonded network where many of the leaders of organizations are familiar with one another. Interviews proposed that senior leaders were unfamiliar with the source of Ushahidi and "who is involved". In particular, most sectors have familiar information sources specific to their sector. A map or situation report contains information that is familiar and in familiar formats for a sector – such as VAM or FEWS for food security (though, admittedly, there is little evidence of the use of these sources for decision making). Several interviews mentioned that crisis mapping and Ushahidi are not recognized to come from a sector or society of their own, and this impacts credibility with some actors.

Use of volunteers was another issue cited by some decision makers[3]. Involvement of professionals, and in particular humanitarian response professionals, is important to credibility according to some responders. For government, official sources of information are also given great importance. Some statements by those interviewed exposed a "suspicion of the crowd", a fear that groups may intentionally manipulate information.

Finally, decision-makers questioned the representativeness of event data. A senior US official wondered about the technology, "how much is this just the tool that picks up neighborhoods where they know about it or where they have cell phones?"

Many of these challenges to credibility are being addressed in reviews of the use of Ushahidi and other social media in the Haiti emergency response. The process of dismissing unfounded challenges to credibility and addressing legitimate problems is well-underway. As one expert said, "US decision-makers have seen the crowd work, in aggregate it [use of social media] led to the understanding that they need this capability -- the Joint Staff is even in discussion of how to integrate the crowd".

4 Efficiency

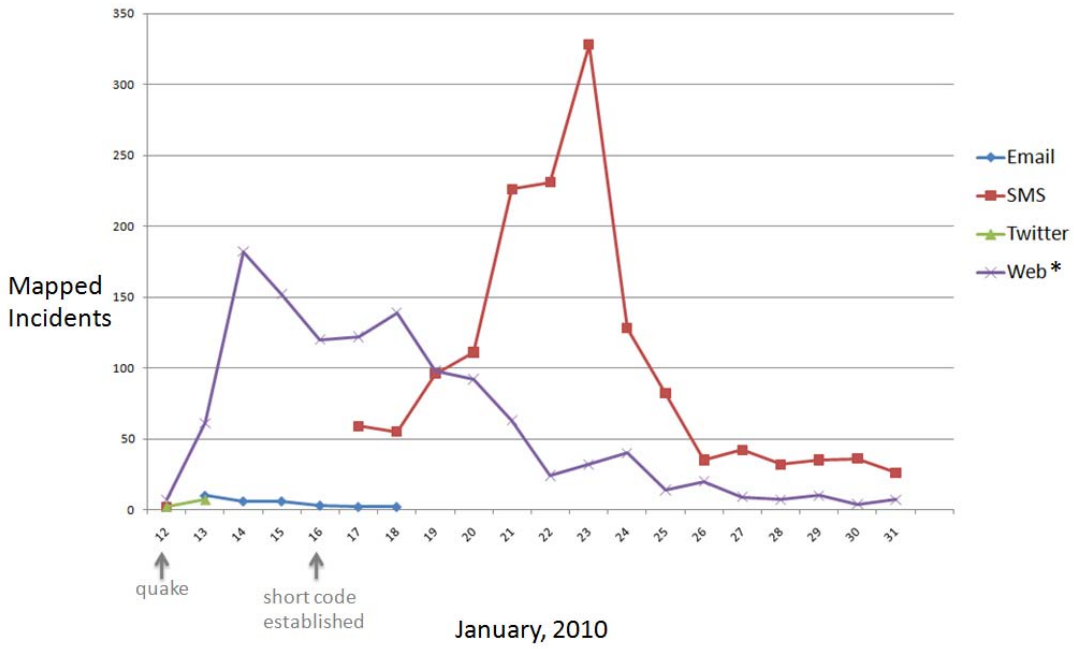
The UHP processed at some level upwards of 15,000 to 40,000 reports (Table 2). The final posting of UHP reports on to the map was the result of the aggregation and processing of an enormous volume of messages originating from a variety of sources (Figure 1). Identification of sources, too, was relatively crude due to the rapidly changing volume and sources of UHP reports. In the Ushahidi database to date, there are 3584 events that have been mapped in Haiti. Of these, 2759 were mapped between Jan 12th and Jan 31st; 80% of the points in the first month and 72% of all points were mapped in Greater PaP (2214/2759 and 2564/3584 events). Messages were classified in to 8 main categories and 50 subcategories (see Table 3).

[3] "Working with volunteers -- unsure of capability and training. Need to go through a process of professionalization. Form a society."
--E Rasmussen

Table 2: Summary of disposition of UHP reports

Messages	Number
Total number of messages from all data streams	40,000 – 100,000+ [4]
Number of messages received by '4636'	40,000 -- 80,000
Number of messages translated available to UHP	15,000 -- 60,000 [5]
Number of reports mapped to UHP from all sources	3584 [6]

Figure 1: Sources of UHP reports during the month of January, 2010



***According to a volunteer source, due to the way incidents were entered into Ushahidi all non-SMS incidents added after the first few days post-quake were added via the web and thus tagged as "Web" submissions. The web category is ultimately a composite of incidents pulled from Email, Twitter and all other non-SMS feeds**

[4] Mission '4636' reports receiving more than 80,000 messages. An interview with UHP volunteer Ida Norheim-Hagtun who is researching a database of "40,000+ messages"

[5] Mission '4636' reports translating more than 60,000 messages. UHP volunteers confirmed the large number of messages, "we do not know how many messages come in, I bet we had 15,000 messages by the time I quit (Spring BreaK)." – Hilde Berg-Hansen

[6] Download available from website

Table 3: Frequency Distribution of Messages According to Classification Criteria

Emergency		# of reports
	Trapped people	117
	Medical emergency	138
	Highly Vulnerable	2
	Fire	6
Vital Lines	Contaminated water	9
	Water Shortage	1133
	Power outage	35
	Shelter needed	477
	Food shortage	1597
	Security Concern	12
	Fuel Shortage	21
Public Health	Medical and Health supplies needed	305
	Infectious Human disease	9
	Chronic Care Needs	2
	OBGYN/women's health	7
	Psychiatric needs	4
	Animal illness/death	0
Menaces and Security threats	Water and hygiene promotion	230
	Looting	22
	Theft of aid	0
	Group violence	0
	Riot	0
Infrastructure damage	Collapsed building	133
	Unstable structures	0
	Roads blocked	29
	Compromised bridge	1
	Communication lines down	0
Natural hazards	After shock	13
	Deaths	2
	Missing people	5
	Asking to forward a message	5
	Floods	0
	Land slides	0
Services available	Clinics and hospitals operating	239
	Food distribution point	235
	Non-food aid distribution point	77
	Ruble removal	7
	Human remains management	30
	Water distribution point	5
	Feeding centers available	0
	Shelter offered	0
	Financial services available	0
	Internet access	0
	Port open	0
Other	Search and rescue	44
	Persons news	287
	IDP concentration	20
	Aid manipulation	0
	Price gouging	1
	Other	4

Key Findings

The fact that a volunteer workforce and processes could be put in to place to handle this volume of tasks speaks to the unusual efficiency of the UHP and its collaborative network including Mission 4636, Crowdflower, and others. The volume of work that was undertaken by a nearly all-volunteer workforce speaks to the incredible potential for crowdsourcing approaches to information management in acute catastrophic emergencies.

However, several areas for potential future improvements were noted based upon examination of the UHP data bases and accompanying chats logs/interviews:

Value-added of the process

- Categorization and subcategorization was not significant value-added for the nature of incidents actually reported. The vast majority of the reports are related to "vital lines". Most subcategories had fewer than 50 reports (see Table 3). Food and water were the overwhelming needs reported, but often the content of messages was not sufficiently detailed to correspond with relief planning needs that relate to the number of people in need and their location. Information relevant to SAR also was infrequent in the data base.
- A large number of the messages did not contain geographic information precise enough to place a point on the map. This is presumably one reason why only 3854 messages of the 15,000 to 60,000 translated messages were placed on the map[7]. The follow-on project to UHP chose to map reports aggregated at the neighborhood level, which is in better alignment with the information needs of most responders in most situations. An over-emphasis on pin point location may have lead to the omission of important messages from the UHP website.
- Important information about the felt experience of individuals and groups is found in many of the messages. These highlight the demographic structure and size of groups of displaced people, and how they have organized themselves to cope with the emergency. There is highly valuable information about the nature of the issues faced by Haitians such as need for medication for chronic conditions, protection issues, and mobility. This rich dataset was captured and archived to the extent that the messages became part of a database, but much of this kind of information was not systematically organized by UHP.
- Geolocation needs generally required less precision than is typically required for SAR because the vast majority of incidents did not indicate immediate SAR action. Only 250 reports indicated trapped persons and/or medical emergencies. These reports were highly concentrated in the first days after the earthquake (see Figures 2 and 3)
- Incident Tracking was not consistently updated in the provided "comments" field of the database or using the "Action Taken" notation feature.

Figure 2: Frequency of Select Categories of Reports

[7] Mission '4636' reports translating 60,000 messages. UHP volunteers consistently report having access to approximately 15,000 translated messages.

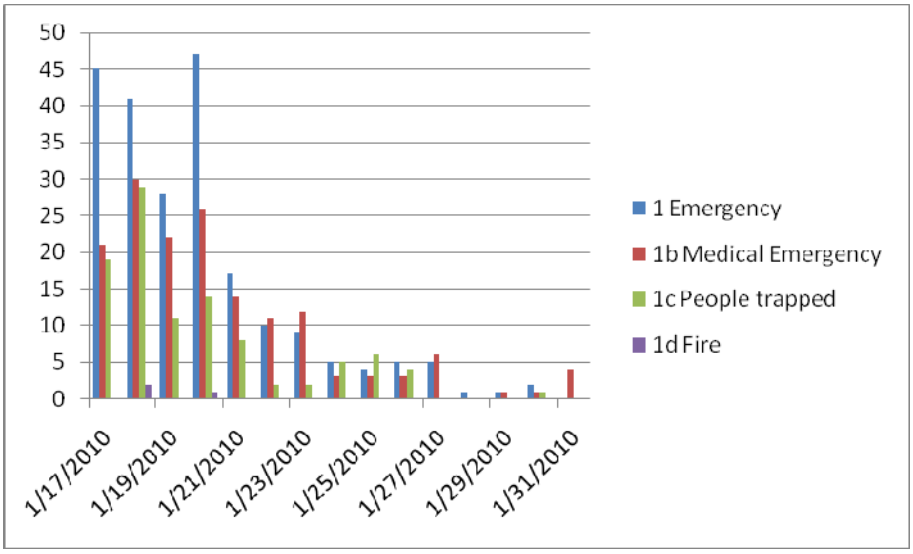
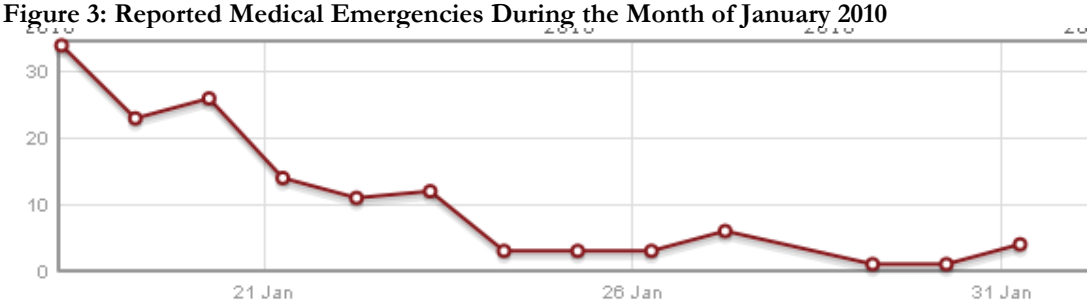

50
45
40
35
30
25
20
15
10
5
0
1/17/2010
1/19/2010
1/21/2010
1/23/2010
1/25/2010
1/27/2010
1/29/2010
1/31/2010
1 Emergency
1b Medical Emergency
1c People trapped
1d Fire

Figure 3: Reported Medical Emergencies During the Month of January 2010



Timeliness and quality

- Reported time for processing of messages *in preparation for posting* was remarkably fast. The time from initial receipt of a message from any source to actual posting on the map data base was not systematically tracked by UHP, but the interviews and chat sessions indicated that at least occasionally, urgent messages may not have been prioritized for posting, suggesting the need for improved mechanisms for triaging reports and greater capacity of volunteers

- Quality assurance that is put in place during similar commercial applications involving short repetitive work (microtasks) such as redundancy, individual monitoring, critical control points, and other metrics was not rigorously applied to UHP volunteer work because of the nature of this implementation. Future implementations, however, could be more effectively organized to implement improved quality assurance.

- Duplicate entries were not infrequent: exact duplicate reports numbered more than 100. There were also reports mapped more than once with different titles. Eliminating the entry of duplicates can be automated.

- Classification was found to have a fairly high rate of error; an estimated 36% of messages were assessed to have been erroneously coded (**Table 4**). Two types of classification errors were observed: incorrect category tags and missing category tags[8]. From the perspective of a user of Ushahidi's category-specific report feeds, incorrect categorization results in an information stream diluted with potentially irrelevant reports, and missing category tags results in stream missing potentially critical reports. The calculated overall rates of 18% incorrect categorization and 30% missing categorization are therefore significant in both regards. Some categories were particularly susceptible to classification error. A random sample of the 195 reports classified as "Services Available" during the first ten days post-quake revealed that only 47% were actually related to service/resource availability, the others being primarily trapped person alerts, appeals for food/water or expressions of general distress. A rapid assessment of the categories indicating food and water needs also indicated particularly high levels of misclassification. Chat discussions suggest that at least some of this misclassification was deliberate in an attempt to move critical reports into what were perceived to be more

[8] For the purposes of this evaluation a report published to the Ushahidi Haiti site was assessed to have been incorrectly classified when it received at least one category tag which was clearly inappropriate or misleading based on the message title, description or comments on the site. For instance, messages communicating a *need* for food or water were often classified as food or water *distribution* points. Likewise, a message was assessed to be missing a category tag when it failed to receive a category tag which was clearly and critically relevant based on the message title, description or comments. For instance, a message described a lack of fuel but was not coded with the "fuel shortage" tag.

closely monitored categories in order to improve the chance that the reports would trigger a response.

Table 4: Estimated rates of overall categorization error

Error type	Percentage of all Reports*
Reports with incorrect category tag	18%
Reports missing a critical category tag	30%
Missing or incorrect category tag (overall error rate)	**36%**
Both incorrect and missing tags	6%
Reports with neither missing nor incorrect tags	64%

*50 reports sampled at random from all 3584

Capacity of organization and volunteers

- In the early days of the UHP implementation, training of new volunteers was not adequate to ensure consistency in all aspects of geo-location and classification. This was recognized and at least partially rectified by the UHP team.
  .
- A marked lack of understanding of operational aspects of emergency response contributed to producing sector and location classifications that were not universally applicable to the day-to-day work of responders.

Table 5: Disposition of Reports Initially Classified as Trapped Persons

Reports of trapped people	117
Reports of trapped people marked SMS	20
Number of non-duplicate reports marked SMS	16
Number of reports that are not clearly from a web-based source (retweet) and are marked SMS	11
Number of reports that are clearly about live trapped people	6
Additional '4636' trapped person reports with proxy of translation	@13

5 Impact

Impact is evaluated through an understanding of the extent that UHP affected the ultimate beneficiaries. It must be noted that this is the most difficult aspect of UHP to assess and this section of the evaluation is supported with the weakest evidence base. Little information for analysis of impact was available to the evaluation team.

It was clear in the interviews that stakeholders strongly believe lives were saved as a result of UHP. Many of those interviewed offered the case of the rescue of a trapped UN worker. Below is a photograph taken by the INSTEDD team of this person; he is the tall gentleman in the center.

 [9]

A review of web-based archives including mainstream news sources, forums, comments on the Ushahidi website, Skype chats and blogs from UHP volunteers also provide some anecdotes about possible impact of UHP in helping people or saving lives (see **Appendix 3: Potential Examples of UHP Impact**). Mission 4636 and UHP volunteers were also solicited via two online surveys for anecdotes and evidence of UHP's impact on the ground in Haiti, but responses to the survey were quite limited and they did not in the end reveal significant evidence beyond what was collected in interviews and via web research. Originally, missions to Haiti by the evaluation team were intended to strengthen this evidence base. These were not undertaken due to significant logistics issues, cost of field assessment and the limited possibilities of successfully following up an adequate number of potential beneficiaries.

It should be noted that the Ushahidi web application is technically structured to capture feedback from responders in that it has basic commenting and status notation features, and that such tools should obviously lend themselves to tracking the activity around incident reports and the creation of a deeper understanding of impact. Unfortunately these tools were not highly used in the case of UHP, as mentioned in the discussion of site commenting activity and illustrated in Table 2. The relatively small number of comments which do indicate that there was an on-the-ground response to a report generally do not identify who the responder might have been or if Ushahidi indeed helped facilitate the response.

It is the judgment of this evaluation team that the Haitian Diaspora and the UHP/Mission 4636 volunteer community--who were often in direct personal contact with quake survivors—may have in some cases had a direct impact through their own individual actions. References to personal interactions between volunteer translators and quake-affected Haitians are evident in the UHP Skype chats and to some extent in survey responses. Volunteers were connecting personally over the phone and via email with quake survivors and offering information, assistance and emotional support.

[9] Photo provided by Eric Rasmussen

6 Sustainability

Sustainability here refers to the continuation of on-going benefits generated by the UHP. Benefits can be viewed as both global and local. Each are reviewed in this section. Three separate questions were answered:

1. To what extent has the UHP experience resulted in increased and sustained demand for similar crisis mapping activities by major donors/actors?
2. To what extent has the UHP experience contributed to a global community of crisis Mappers?
3. Did the UHP result in durable local capacity development and ownership of Haitians?

It is important to note, however, that sustainability does not equate with continuation of a "UHP" in Haiti. Crisis mapping is a tool for crisis management, itself a time-bounded endeavor. Ushahidi is an organization, so continuation of UHP activities and benefits must appropriately integrate in to Haiti institutions and activities. The UHP deployment has demonstrated strong evidence of sustainability in that regard, recognizing its inherent ephemeral nature as a response tool.

To what extent has the Ushahidi Haiti Project created a group of International Crisis Mappers Network?

At an International level, UHP experience has propelled crisis mapping and the International Crisis Mappers Network to a larger response community and has resulted in dramatic growth in the crisis mapping community.[10] "From the November meeting then during Haiti, Crisis Mappers went from 100-700 members. The who's who of the response community, the policy community, the UN general secretary office, the white house, and the technology community." A key factor in the explosive growth was the foundation that was established during the crisis mapping conference in November of 2009 (ICCM 2009)[11] which built the initial relationships that supported and communicated information about the UHP project. As Patrick Meier pointed out "through crisis mappers group, we have all sorts of contacts with responders, the UN, south com -- the channels of communication were open". But the UHP experience was the first one in which the world saw and acknowledged the promise of crisis mapping.

As one of the UHP team noted:

> the reason that the crisis mappers has taken off is because of what Patrick Meier did before Haiti, he got the group together a year ago at the ICCM conference, whole point of getting the community together in case something happened, and then Haiti happened and everyone was already put together, the Haiti success has catalyzed the group and now we are ready for any emergency, for instance the Pakistan floods, because they have seen it happen before, they are ready for it. It worked because of the different people that were there it was not all academics, responders, or coders, it was a great group that all spoke in language that we could all attend, the atmosphere that we could all work together.

[10] http://www.crisismappers.net/: Leveraging mobile platforms, computational and statistical models, geospatial technologies, and visual analytics to power effective early warning for rapid response to complex humanitarian emergencies.
[11] http://crisismapping.ning.com/page/iccm-2009

Evidence of sustainability also is found in the deployments of similar but improved activities in more recent disasters. UHP volunteers were involved and building capacity for responses in Chile and then floods in Pakistan based on learning from their work processing reports for Haiti[12].

The sustainability of the crisis mapping community is also enhanced by the strong link that Ushahidi and the crisis mappers have established with academia. Tufts University, Stanford University and Harvard University were where many of the people involved in UHP and supporting networks met. Craig Clarke who provided intelligence information for the Marines working in Haiti knew about UHP from a Marine doing an educational tour at Tufts University. Marco Rotelli of INTERSOS based in Rome knew about UHP because a former staff member was doing their Master's degree at Tufts. CrowdFlower, Samasource, and the people principally involved with Project '4636' knew each other from professional circles, Stanford, and/or were neighbors in San Francisco. Much of the high level "who is who" can be traced back to these and other influential institutions and networks– underlining the important roles that Universities have played in the development of his approach and technology. However, it is important to note that the university initiatives are primarily student driven, with little faculty involvement. This limits the sustainability of the production of well prepared student volunteers to a substantial extent. Within academia, hundreds if not thousands of graduate students each year are studying international disaster management/ humanitarian assistance. The effectiveness and efficiency of UHP was somewhat compromised by the fact that many student volunteers were not yet adequately trained in crisis mapping techniques or exposed to the humanitarian system. Faculty engagement would help ensure greater preparation of a pool of student volunteers for the future.

Institutionalization of UHP in Haiti

In Haiti, the UHP has made a great effort to transition the work that they started and continue to be a resource to the emergency response community there. A Haitian partner was identified that had been creating a similar capacity to make dynamic maps in parallel to UHP. The IT firm, based in Port Au Prince, Solutions, had experience working on Government and NGO projects had been developing a system for tracking the needs of earthquake affected people that included a call center with a separate short code (177). An NGO called Samasource that focuses on providing jobs in poor and disaster affected communities through microtasking had already planned to set up a center near PaP. The UHP team assisted in development of Solution's own crisis mapping platform and assisted with introducing the site called Noula.ht to the humanitarian community, as the UHP team built up partnerships and networks during their operations on the ground. Additionally, UHP facilitated a connection between Solutions and Samasource. The ability to transfer the work over to a Haitian firm to provide the core functionality of the UHP project to the extended relief effort will build a great deal of confidence among the humanitarian community.

At an individual level, several UHP volunteers are now working in different capacities in Haiti. One is active with the UN cluster system and another with the telecommunications firm that provided the 4636 short code. Volunteers have traveled to Haiti to train staff that will now be working with Noula.ht.

Donor/influential actor commitment

UHP's impact on donor/influential actor commitment was substantial as indicated in press releases as well as continued engagement of the UHP team. Interviews with several respondents working with the military attribute UHP as being critical for the breakthrough in executive level demand for crisis mapping/social media. One respondent said that because of UHP, many executives now "get it". They know that they now need this capability. From the very first email

[12] "Trained people at Colombia to work with cirsis mapping in Chile" –interview with Ida Norham

asking for volunteers to place reports on the site, there were "endorsements from the Clinton Foundation and UNDP"[13]. Traditional media covered UHP from the early days adding to executive awareness.

The UN Interagency Standing Committee also has voiced its recognition of the importance of what was started by UH: "another innovative communication technique enabling population to voice their concerns is crisis mapping….Which allows users to submit…The international humanitarian community needs to learn from such initiatives and develop a robust strategy to enable effective dialogue with affected people."[14]

7 Recommendations

The Ushahidi Haiti Project represents an impressive proof of concept for crisis mapping/crowd sourcing applications to large scale catastrophes. The innovativeness, creativity, adaptability and leadership of the UHP team was instrumental to this outcome as was the dedication of the vast numbers of volunteers. Still, as with many innovations, its effectiveness, efficiency and especially impact can be greatly improved. Recommendations related to the broader enterprise of crisis mapping implementation and specifically to the Ushahidi platform are discussed below:

Related to Strengthening the Network of Crisis Mappers:

The strong engagement of Ushahidi with academia has had two important effects. First it provided significant credibility to the UHP enterprise. This finding was noted by many of the persons interviewed during the evaluation. The second is a renewable and continuous supply of cognitive capital in the form of students. On the other hand, student human resource pools have great variability in their familiarity with the humanitarian system and practice, resulting in potential inefficiencies and negative secondary impacts. Professionalizing academic involvement might be facilitated by:

- Develop a higher education task force as part of the ICM Network and ICCM
- Recruit faculty sponsors to crisis mapping projects. These may need to be compensated or provided research opportunities. However, faculty participation is critical for greater engagement of academia, sustainability and improved support/supervision of student volunteers
- Create a crisis mapper certification and roster of volunteers that are prepared to assist in the training and deployment of student volunteers.
- Develop a volunteer recruitment and management plan that identifies tasks and student profiles that fit the tasks. Target recruitment from academic programs that maintain global disaster management/humanitarian assistance educational programs. Only include other students when tasks are specifically matched to need and capabilities.
- Expand the number of just in time training products for volunteers, perhaps in the form of web-based videos.

[13] Email dated

[14] IASC, Response to the Humanitarian Crisis in Haiti: Achievements, Challenges and Lessons to be Learned, 2010.

Traditional humanitarian field operators were the least enthusiastic stakeholder group about the relevance and utility of the UHP activity, whereas headquarters analysts were frequently among the most enthusiastic.

Related to Improving the Relevance and Effectiveness of Similar Initiatives in the Future:

The UHP was relevant and effective in meeting the information needs of some stakeholders more than others, but in all cases, areas for improvement were identified. Recommendations are both stakeholder specific and cross cutting:

Traditional humanitarian relief community

. The following are priority considerations:

- Identify champions among the UN, NGO and influential organizations to help strengthen the utility of crisis mapping for traditional humanitarian field operators or at a minimum, harmonize this work with existing information efforts
- Improve the accuracy of classification approaches utilized in crisis mapping through closer collaboration with seasoned field operators, better trained/supervised volunteers, and improved integration of intelligent summary tools with crisis mapping.
- Engage actively in the UN Cluster information management group and CDAC
- Shape the information characteristics of map aggregators based upon a systematic survey of humanitarian operators
- Inventory and target capacity building opportunities among UN and large non-governmental organizations such as executive and operational staff trainings where crisis mapping can be included
- Organize a space on the crisis mappers website for continuous mini "Ignite" presentations where promising applications of use can be showcased as they are discovered.
- Develop selected closed network applications (password protected) in order to ensure protection of vulnerable populations.
- Partner with capable organizations for case management of medical emergencies and issues like trapped people. Partner with an organization with professional staff to handle geolocation reach-back for SAR-like information needs.

For small non-profit organizations and citizen responders

- Create mini capacity building videos that reinforce humanitarian response basics and effective use of crisis mapping in response. Emphasize protection issues. It is especially here that potential protection threats are the most likely and critical.
- Create lessons learned webinars for new humanitarians, targeting small organizations that utilized UHP in order to sensitize them to humanitarian best practices and pitfalls.

For affected populations and diaspora

- Strengthen ties with CDAC and emphasize early identification of respected authorities and communications channels among affected populations to improve reporting frequency.
- Ensure that short codes and reporting channels/instructions are unambiguous and clear in purpose and use.

- Consider brief surveys back to reporters (those reporting information to post) to determine status of report requests/incidents in order to better monitor impacts, both positive and negative.
- Develop guidelines and protocols for translator engagement with affected people. This should include direction on referral and contacting affected people.

Cross-cutting recommendations

- Continue to actively manage the development of crisis mapping applications in catastrophies, recognizing the dynamic nature of disasters and resulting information needs; growing diversity of humanitarian stakeholders; potential protection issues; and the emergence of innovations in humanitarian practice.
- Improve the quality of aggregation of information through better categorization and more intensive use of analytic/visualization tools. Reflect in these approaches recognition of the dynamic nature of information needs during catastrophies.
- Continue to work on improving the capacity of crisis mappers in the area of geolocation, including appropriate level of precision based on need or phase of the crisis.
- To the extent that incident status tracking and updating can be streamlined and adopted by Ushahidi users, impact as well as evidence of impact will also likely be strengthened. Explore ways to motivate and facilitate users of Ushahidi and similar platforms to "track" and "close" reports. Improve sorting and monitoring of comments and incident status updates. Consider even tighter integration of the Ushahidi web application with major social networks to help jump start broad user community activity for new implementations.
- Data structure and processing of reports must be improved to include mandatory meta-data to meet an international standard such as the ISO 19115.
- Identify institutional partners outside of UHP that can reliably provided geo-locational reach-back for SAR teams and the military during the early days of a response, and also identify partners that can case manage reliably the few urgent reports such as 'trapped people' or 'medical emergencies'
- Improve information utility by increasing the diversity of intelligent summary tools and reporting features of the Ushahidi web application. Consider collecting up-dated analysis summaries in situation reports, organized in ways that partners can use them and distributed in ways that they can receive them.
- Understanding that a single report categorization scheme can't meet the needs of all organizations at every phase of a crisis, consider the creation of an "advanced search" interface which enables data users to produce more customized subsets of reports based on a user-defined search terms (i.e. Boolean, full-text), and ensure that these subsets are also output in multiple common formats (e.g. web, rss, csv, xls).
- Cater to more sophisticated information consumers and facilitate exchange of information between systems by continuing the development of the Ushahidi API. Consider expanding the API to output reports as KML and GeoRSS with the same degree of control as currently provided for XML and JSON.

8 Appendices

Appendix 1: Interviews

Core Staff Interviews

- Denise "Roz" Sewell
- Jaroslav Valuch
- Rob Baker
- Thomas Mckenzie
- Ida Norheim Hagtun
- Patrick Meier
- Jessica Heinzelman
- Josh Nesbit
- Robert Munro -- Energy for Opportunity and Stanford University
- Peter Walker

Other Stakeholders Interviewed

- Brian Herbert- Ushahidi Core
- Craig Clarke - US Marines
- John Crowly - HHI
- Kate Dowd - US State Department
- Daniel Friedman - US State Department
- Kurt Jean Charles - Solutions
- Dr. Carl Taylor -- Assistant Dean College of Medicine University South Alabama
- Marco Rotelli - INTERSOS
- Lukas Biewald - CrowdFlower
- Eric Rasmussen - INSTEDD
- Ana Schulz - Ushahidi Haiti
- Sabina Carlson - Ushahidi Haiti
- Hilde Berg-Hansen - Ushahidi Haiti
- Kate Chapman – 40th Swan
- Ricardo Arias – USSOUTHCOM
- Melissa Elliott – Canadian citizen responder
- Gary Eilerts – FEWSNET
- Gisli Olaffson – Icelandic USAR
- Ruben Flores – New York City Medics
- Ivan Sigal – Global Voices

Appendix 2: Draft of Timeline and Events

Ushahidi Haiti response timeline

Note: The following is based on available information; further additions and verification may be necessary.

Jan 12

- 4:53 PM (EST) Magnitude 7.0 earthquake strikes 15 miles WSW of Port-au-Prince, Haiti
- 2 hours after the earthquake, Patrick Meier and David Kobia establish the Ushahidi Haiti platform.
- Coordination begins with International Network of International Crisis Mappers Network, and UN OCHA/Columbia
- Chris Blow and Brian Herbert continue customization of the platform
- Initial reports plotted via twitter, e-mail and news reports

Jan 13

- 3 am EST customization of Ushahidi Haiti platform continues in Nairobi

Jan 15

- Coordination began with US state department and INSTEDD
- e-mail sent by Patrick Meier to Fletcher school of Law and Diplomacy asking for volunteers.

Jan 16

- 4636 short code established in Haiti through cell provider Digicell
- Radio messages in Haiti broadcast, "text need an location" to 4636.

Jan 17

- Direct communication established with US Coast Guard responders in Haiti
- Skype communication established with INSTEDD team in Haiti
- Ushahidi Haiti situation room initial set up in Patrick Meier's residence
- Recruitment of Haitian Creole translators begins

Jan 18

- Satellite situation room opened in Washington DC

Jan 19

- Request from US Coast Guard and Joint Task Force Command Center for instructions on how to use Ushahidi feed.
- Aid group clusters reported receiving SMS feed

Jan 21

- US Secretary of State Hilary Clinton comments on the role of mobile phone technology being used to save lives in Haiti.

Jan 23

- Volunteer training session held at Fletcher

Jan 24

- 230 volunteers trained at Fletcher school of Law and Diplomacy.
- Satellite offices running in London, Geneva, New Haven.

Jan 26

- CrowdFlower platform utilized to improve efficiency of crowsourced translators

Jan 27

- Marines Corp in Haiti reports to Ushahidi Haiti team that it is "saving lives every day

Appendix 3: Potential Examples of UHP Impact[15]

#	Incident/Report	Impact/response	Use of UHP for response	Evidence	Link
1	UN worker trapped in building	Rescue of UN worker	**possible**	Anecdotal and photographic evidence from interviews and mainstream news	
2	Automobile accident	People taken to hospital	**probable**	Report on UHP site plus key interviewee's anecdote attributing response to Ushahidi	http://haiti.ushahidi.com/reports/view/2262
3	Haitian family needing food	Money sent personally by 4636 volunteer	**probable**	Volunteer's personal account in the survey in addition to references in skype chats.	
4	Missionaries contacted directly by volunteer	supplies delivered by military to missionaries	**probable**	Personal anecdote from a volunteer survey describing their effort to contact missionaries.	

[15] Appendix 3 does not include cases where Ushahidi may have had a direct or indirect impact on Haitians through provision of general situational awareness (e.g. by contributing to the US Marines process for identification of geographic areas of highest need). Also, the table does not comprehensively present all examples where UHP/Mission 4636 volunteers may have had an impact through their own personal interactions with quake-affected Haitians.

5	People trapped at supermarket	SAR response on site	possible	Anecdote by volunteer in survey describing a response based on Ushahidi report	
6	Orphanage in need of food, fuel and water	doctors and supplies delivered by Salvation Army	possible	Response noted on site using Action Taken notation	http://haiti.ushahidi.com/reports/view/765
7	Bresma Orphanage in need	children evacuated	possible	Response noted on site using Action Taken notation	http://haiti.ushahidi.com/reports/view/581, http://haiti.ushahidi.com/reports/view/882
8	FDS orphanage needs water	Water sent to orphanage	possible	Response noted in site comments	http://haiti.ushahidi.com/reports/view/1070
9	Available resources at airport	Resources assigned	possible	Response noted in site comments	http://haiti.ushahidi.com/reports/view/1119
10	Clinic needing supplies	Orthopedic clinic finds supplies	possible	Response noted in site comments	http://haiti.ushahidi.com/reports/view/1245
11	Missing person	Missing person found	possible	Response noted in site comments	http://haiti.ushahidi.com/reports/view/163
12	Orphanage needing help	Children ok and evacuated	possible	Response noted in site comments	http://haiti.ushahidi.com/reports/view/389
13	Missing person	Missing person found	possible	Response noted in site comments	http://haiti.ushahidi.com/reports/view/474
14	Orphanage needing water	Water deployed to orphanage	possible	Response noted in site comments	http://haiti.ushahidi.com/reports/view/580

15	Missing person	Missing person found	possible	Response noted in site comments	http://haiti.ushahidi.com/reports/view/584
16	Orphanage needing food/water	Food and water received	possible	Response noted in site comments	http://haiti.ushahidi.com/reports/view/606
17	Foyer de Sion orphanage running out of water	Food, water, medical supplies delivered	possible	Response noted in site comments	http://haiti.ushahidi.com/reports/view/642
18	Children at orphanage moved to safety	Children moved to safety	possible	Response noted in site comments	http://haiti.ushahidi.com/reports/view/761
19	Water delivered to Foyer de Sion Orphanage	Water delivered	possible	Response noted in site comments	http://haiti.ushahidi.com/reports/view/936