Humanitarian Communication: Challenges and Opportunities

Introduction

There is no doubt that natural disasters have been increasing in frequency and magnitude. While the number of people killed by disasters has steadily fallen over the last century, both the number of disasters and number of people affected by disasters have jumped dramatically (Figure 1) (Natural Disaster Trends, 2009). Disasters are becoming more expensive too; the annual damage caused by them increased eightfold from the 1970s to the 2000s.
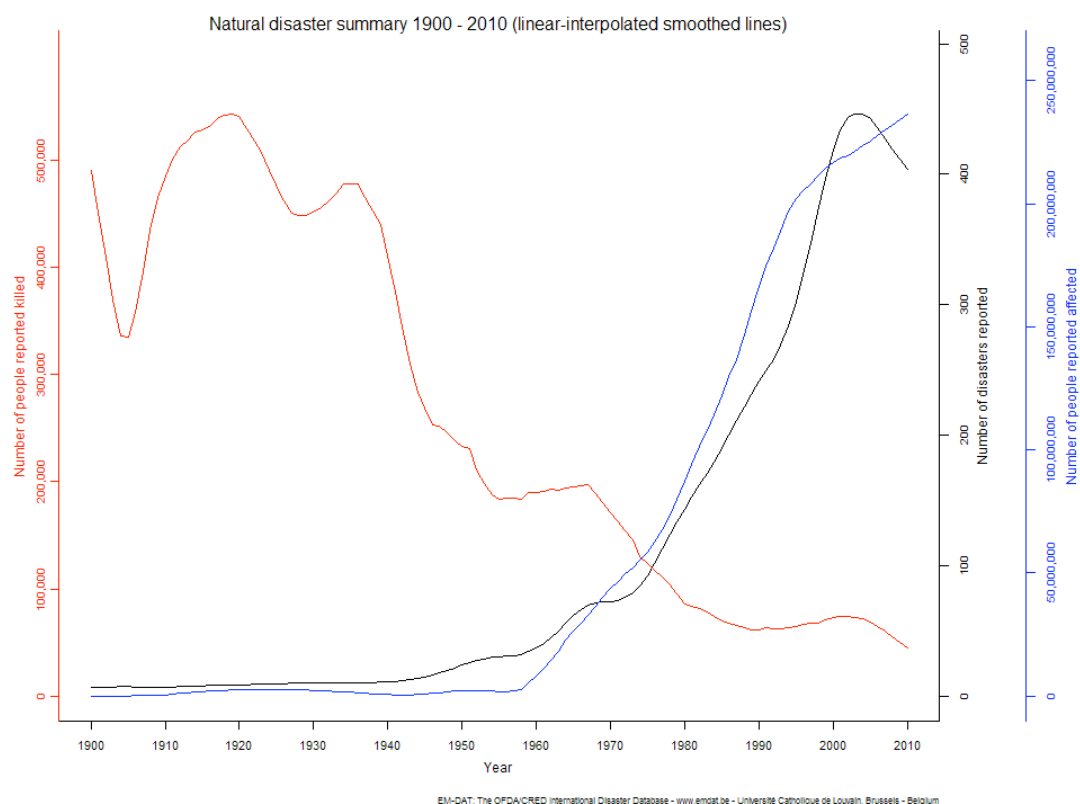

Figure 1: CRED Disaster Trends 1900-2010

The recent memory of the 2004 Indian Ocean Tsunami, 2005 Hurricane Katrina, 2010 Haiti Earthquake, and 2011 Japan Tsunami only adds to the gravity of these numbers. While the debate is still open as to what is causing this rise, one thing is clear: the need for humanitarian relief is greater now than ever before.

And help is coming from all corners. The humanitarian fieldworker population has increased 6% annually for the last decade (Harvey et. al, 2010). Some volunteers are even finding ways to get involved without ever leaving home, providing assistance with their computers and cell phones (Starbird, Palen, 2011). At the same time, humanitarian organizations have shown a renewed interest in improving their systems and policies. Academics have come alongside these groups with a host of new conferences including the Information Systems for Crisis Response and Management (ISCRAM) conference, the Health & Humanitarian Logistics conference hosted by Georgia Tech, and the Humanitarian Logistics Conference run by the Fritz institute.

All of these groups want to improve humanitarian relief, and with 80% of humanitarian aid consisting of logistics efforts, many are focusing on how to deploy people and supplies more effectively (Sangiamkul, 2011). Much work has been done to take methods and systems from industrial logistics and apply them to humanitarian problems. Yet the complexity of the humanitarian sector and instability of crisis environments makes the transfer problematic.

Regardless of complexity, when it comes to logistics, information is critical. Goods and services are effectively distributed only when information is used effectively. Being a medium of information exchange, Computer Mediated Communication (CMC) will be critical to improving humanitarian relief. The remainder of this paper will take a look at the characteristics of humanitarian relief, examine where the field is heading, and consider how CMC systems should be designed to promote humanitarian goals. We will begin with a brief overview of logistics.

Logistics

Logistics is the art of providing the right supplies in the right quantities to the right location at the right time (Beamon, Balcik, 2008). The basic flow of humanitarian logistics then is to determine where there is need, procure supplies meeting that need, and move those supplies from where they were purchased to where they are needed. Beamon and Balcik refer to these three stages as assessment, procurement, and shipping.

Assessment is typically performed by a relief organization employee deployed in the disaster area within 24 hours of crisis occurrence. A survey of local infrastructure, supplies, and unmet need is completed by this employee.

Procurement in the humanitarian sector occurs by requesting both cash and in-kind donations. Cash donations provide organizations the flexibility to seek out alternate suppliers for goods. In-kind donations forgo the step of needing to purchase goods, but may provide less flexibility in

the type of good and shipping options. The procurement process normally begins within 36 hours of a disaster's strike.

Finally, humanitarian organizations must decide how to move both goods and people to and from areas of need. Not only do humanitarian personnel need to be transported, but beneficiaries often need to be moved as well. Sometimes this includes bringing beneficiaries to a point of aid, such as a field hospital.

While the overarching process of assess, procure, and ship will be familiar to those performing industrial logistics, the ad-hoc means by which these steps are completed in crisis situations, and the time constraints on their execution are altogether foreign. The crisis environment and structure of humanitarian organizations present unique challenges that influence the design and use of humanitarian CMC.

Humanitarian context

Humanitarian aid is provided in an environment that is nothing short of chaotic. Stability of infrastructure, supply, demand, and the political environment cannot be assumed.

- Infrastructure – Humanitarian aid faces infrastructure problems on two fronts. First, depending on the magnitude of the disaster, local infrastructure including roads, rail lines, and airports may have been destroyed through the course of the disaster. In this case, alternate means must be sought out. Secondly, even if infrastructure is preserved, the sudden spike in need for material and personnel transport may flood established systems beyond their capacity. This overloading is evident as highways leading from disaster areas often become gridlocked with evacuating locals. Humanitarian organizations are then left competing for the use of the same limited means of transportation.
- Need/Demand – The demand for goods and services in crisis situations is quite different from that experienced in most industry contexts. Whereas industry logisticians may predict future demands based on historic trends, demand in humanitarian situations is unpredictable in time and magnitude. Also, whereas demand in industry often has a several week lead time, meaning there is a gap between when the product is requested and when it is actually needed, in crisis situations the request for aid and need for aid occur simultaneously. In addition, it can be hard to predict which goods will be needed. Certain goods like clean water,

food, and shelter are needed in almost every crisis, but demand for certain goods like vaccinations is highly contextual.

- Supply – Whereas industry based organizations have predetermined suppliers and prices, humanitarian organizations often do not find suppliers before a crisis due to the aforementioned unpredictability of which resources may be required. Humanitarian organizations typically make bids for supplies after a disaster has occurred, and the sudden spike in demand makes it common for suppliers to price gouge.

- Political context – Adding to the dynamic context is the possibility for disasters to occur in areas with political instability. As the recent famine in Somalia demonstrated, even if humanitarian workers are able to provide assistance, local authorities (or terror groups) may refuse aid, either for sense of national pride, or fear of losing control (Starr, Lister, 2011).

Humanitarian Organization

Beyond the dynamic context, there are several distinctions between industry and humanitarian organizations in how they choose to structure themselves.

- Value – Most humanitarian organizations are non-profits. Instead of maximizing profit, they work to maximize assistance. Humanitarian organizations also value equality, dignity, and neutrality in ways altogether different from industry. The Red Cross Code of Conduct is the clearest and most widely held statement of value for humanitarian organizations. The code has ten core principles, none of which is to turn a profit:
    1. The humanitarian imperative comes first.
    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.
    3. Aid will not be used to further a particular political or religious standpoint.
    4. We shall endeavour not to act as instruments of government foreign policy.
    5. We shall respect culture and custom.
    6. We shall attempt to build disaster response on local capacities.
    7. Ways shall be found to involve programme beneficiaries in the management of relief aid.

8. Relief aid must strive to reduce future vulnerabilities to disaster as well as meeting basic needs.

9. We hold ourselves accountable to both those we seek to assist and those from whom we accept resources.

10. In our information, publicity and advertizing activities, we shall recognize disaster victims as dignified human beings, not hopeless objects (Code of Conduct, 2011).

- Partner organizations – Humanitarian relief often comes through the collaboration of several organizations. These range from international organizations, national governments and militaries, religious groups, private businesses, and non-governmental organizations. Each of these collaborating organizations may choose which other organizations they wish to work with, share resources with, and consult when making decisions. The resulting coalition is a web of varying levels of openness and connectedness between organizations.

- Accountability – Humanitarian organizations exist in a paradigm where the consumers are not the purchasers. In this case, humanitarian organizations are accountable to both donors for making good use of the funds they provide and to beneficiaries for providing quality and equitable care. Donors have difficulty seeing the effectiveness of their contributions, and beneficiaries have little power to influence the aid they receive.

- Employees – Humanitarian originations also choose to fluctuate staff size in response to disasters, meaning that their number of employees shifts in magnitude regularly. This implies that humanitarian have a significant number short term or volunteer employees.

- Organization – Humanitarian organizations often decide to be much flatter than industry organizations. There are fewer layers of hierarchy and field workers are given more power to make decisions and act on them.

Future Trends

Researchers have acknowledged these differences and a new field of Humanitarian Service Science & Engineering is emerging to specifically address the needs of humanitarian organizations (Haselkorn, 2008). This field envisions a future humanitarian sector where:

- Action and decision making occur at the lowest possible level

- Direct action by humanitarian organizations and international agencies is replaced by capacity building, standards setting, and monitoring
- The distinction between relief and development has disappeared, replaced by stages of integrated humanitarian action to build capacity and meet needs
- Collaboration among stakeholders is open, extensive, and supported by effective, appropriate infrastructure and systems
- All programs and systems are socially, culturally, and organizationally appropriate
- There is a scientific approach to understanding the role of localized, indigenous knowledge

The fourth vision of HSS&E is especially relevant to CMC and speaks to the need for open communication between humanitarian organizations, donors, and beneficiaries. There are six major channels for communication between and among these groups (Figure 2). We will consider each of these channels in turn.
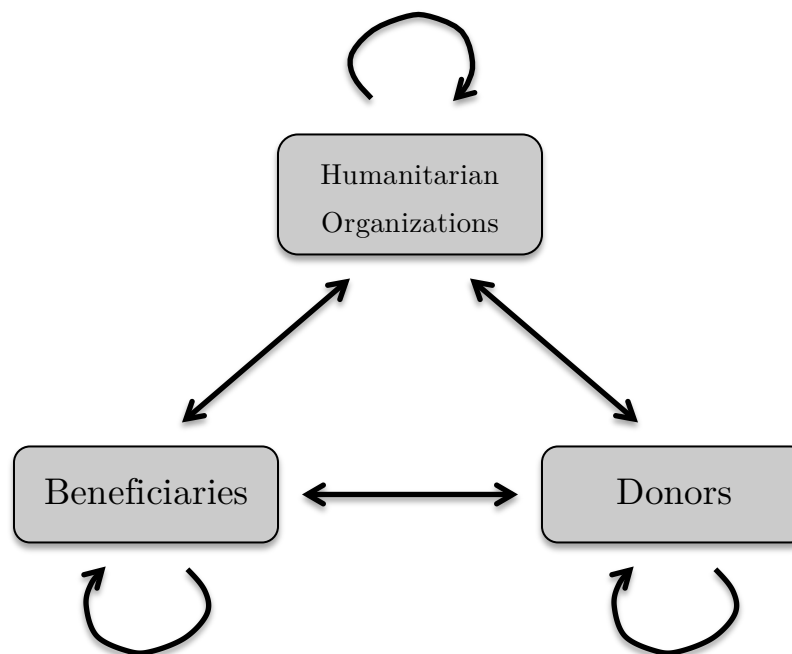

Figure 2: Communication Channels

Beneficiary – Humanitarian Communication

There is growing recognition that beneficiaries are the true first responders to crisis (Palen et. al, 2010). They are the ones who have the most immediate and complete knowledge of the disaster at hand. In this spirit, the NSF *EPIC: Empowering the Public with Information in Crisis* project is investigating how grass-roots information can be leveraged and aligned with

official information sources for optimal decision-making (Palen et. al, 2010). While EPIC is still defining the scope of this task, organizations like Ushahidi are already pursuing EPIC's vision.

Ushahidi is an open-source mapping platform developed for recording and sharing information about crisis needs and human rights violations. Developed in the aftermath of the 2008 Kenyan election violence, Ushahidi has been used worldwide, most notably during the 2010 Haiti earthquake and 2011 Japan Tsunami (Figure 3). The program allows people to submit requests for aid or justice using a variety of media including SMS, email, Twitter, and Facebook. Volunteers take this diverse dataset, translate it into relevant languages, and map the requests onto a Google map of the affected region. Humanitarian workers may then access the map for up-to-date information on the specific location and scope of beneficiary need.
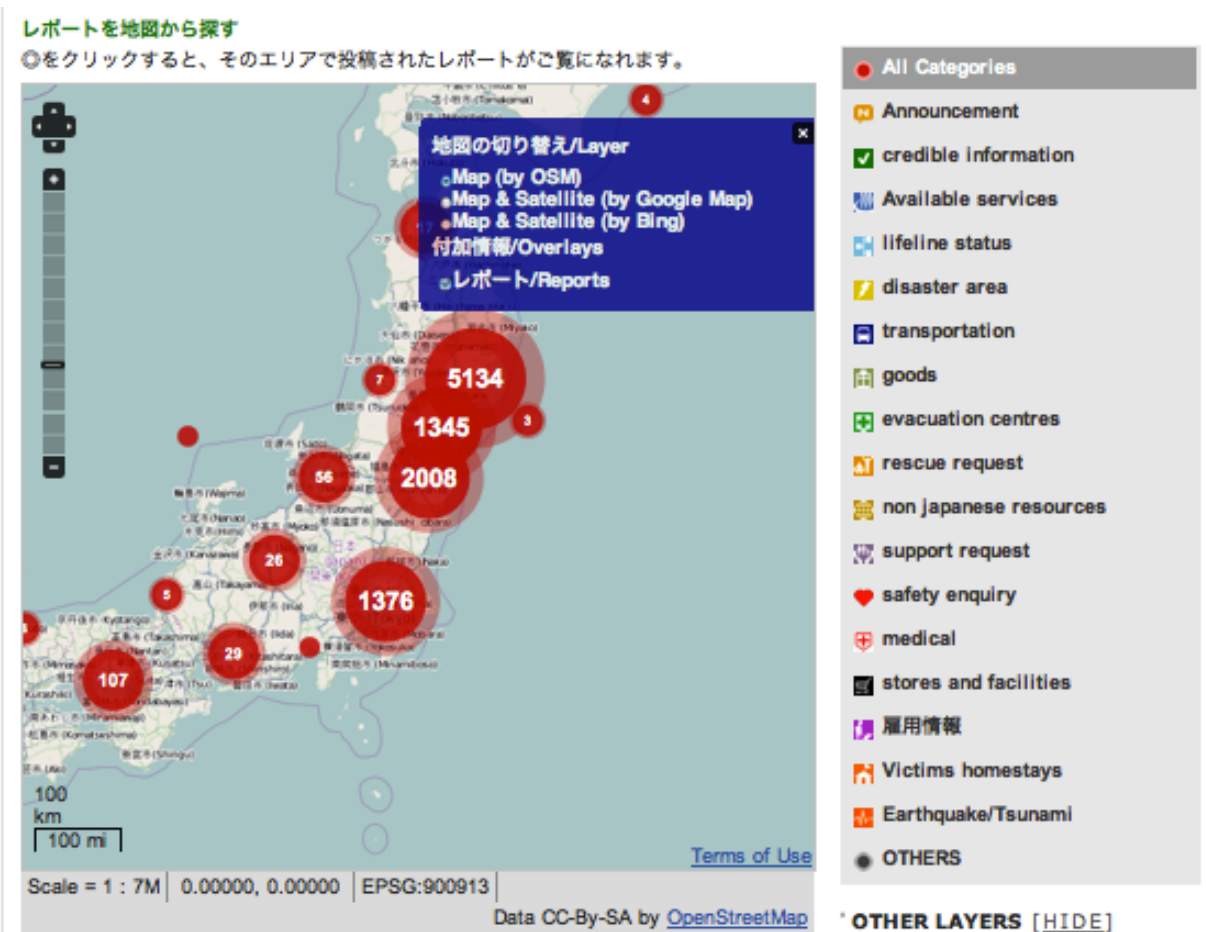

Figure 3: Japan Tsunami Ushahidi Map

(Retrieved from http://community.ushahidi.com/deployments/deployment/sinsai.info)

Ushahidi proved so effective in response to the 2010 Haiti earthquake that Craig Fugate, the head of FEMA, called the program the "most effective and up to date map available to the

humanitarian community" (Meier, 2011). The system also proved very responsive. Ushahidi took on average only 10 minutes to translate an SMS request for help into a map entry during the Haiti earthquake. This is quite remarkable considering that raw SMS data from people in Haiti was being sent to volunteers around the world to be translated and posted on the Ushahidi map. No one was getting paid to do this work, yet it proved more effective than the combined assessment efforts of the Haiti humanitarian coalition.

Researchers also noted during the Haiti crisis that a group of volunteers used Twitter throughout the crisis to collect calls for help. These *Voluntweeters* standardized the tweets using a specific syntax of hashtags called Tweak-the-Tweet, and retweeted the revised calls for help to humanitarian organizations (Starbird, 2011).

Though systems like Ushahidi and Tweak-the-Tweet seem to have provided benefit to humanitarian efforts, issues of information quality and trustworthiness must be considered. The ability of any person to post to public repositories allows for scammers to request for aid when aid may not be needed. Alternatively, exaggeration of need may be used to ensure an individual's need receives attention. Researchers need to ponder frameworks of trustworthiness such as Riegelsberger et. al's, and consider how contextual properties of a CMC system can incentivize providing accurate information (Riegelsberger et. al, 2005).

Also, any system that relies on beneficiary self-reporting must consider the bias introduced by the reporting medium. If a system only accepts SMS, Facebook, Twitter, or email, persons without access to such technologies may be underrepresented in the assessment map.

Finally, thought must be given to two-way communication between organizations and beneficiaries. Even with Ushahidi, information on how to send SMS messages to the system had to be distributed via radio messages. One could imagine a system that found all phones within range of a cell tower and sent information via SMS to all phones within the tower's reach.

Humanitarian – Donor Communication

The humanitarian – donor relationship is plagued by invisibility. Donors and not certain their contributions are being used effectively. To ensure effectiveness, donors give to causes that provide direct benefit. Thus, paying for food and water takes higher priority than contributing to a technology fund. Meanwhile, humanitarian organizations are keenly aware of the benefit of investing in communication systems. Opening up channels of communication between humanitarian organizations and donors could pave the way for increased investment in field deployed CMC systems.

For example, World Vision's LMMS system allows the organization to track the distribution of aid to beneficiaries through the use of rapidly printed ID cards (Last Mile, 2011). Beneficiaries give World Vision basic demographic data and are issued a photo-ID replete with printed barcode. Beneficiaries must present their ID and have it scanned before receiving rations. This constraint prevents double-rationing and makes it much easier for World Vision to track its supplies. There is great opportunity for the LMMS system to be expanded to include donors. Donors could "follow" a specific number of beneficiaries based on the amount of their donation. Using LMMS, donors could see who received aid (including name, age, gender, photo, and aid received) as a direct result of their contribution. Such transparency could promote donations to further development of CMC that would make distribution efforts more effective while simultaneously improving communication between donors and organizations.

Beneficiary – Donor Communication

Improved Beneficiary – Donor communication has the potential to increase accountability in humanitarian aid. Those who have the power-of-the-purse over humanitarian organizations (donors) are distant from those who can accurately determine the quality of that organization's aid (beneficiaries). Thus, deciding which organizations are making effective use of donated funds is difficult.

There is a great opportunity to open channels between donors and beneficiaries by allowing beneficiaries to Tweet, SMS, email, or use other systems to give feedback on the quality of aid they receive. If this information is allowed to go unfiltered, straight to donors, humanitarian organizations could be held accountable for the quality of aid they provide.

Inter-Humanitarian Communication

Collaboration among humanitarian organizations has not seen much development of novel CMC. Organizations are still relying on traditional forms of communication (telephone, email) for collaboration. In 2009, the UN made a step towards increasing coordination by rolling out the Cluster System (The Cluster System, 2011). Eleven clusters coverings areas such as food protection, health, and education categorize on the entire scope of humanitarian aid. When a crisis occurs, a specific organization is assigned to head each cluster and every organization involved in the relief effort must assign a contact for each of the eleven clusters. In this way crisis response is delegated based on type of assistance and humanitarian coalitions have a clear understanding of who to contact when decisions must be made regarding a specific cluster's activities.

Yet, sharing of technology or information resources is still minimal. The most adopted information technology in humanitarian organizations has been Geographical Information Systems (GIS) (Harvey et. al, 2010). Yet, even GIS adoption has been ad-hoc and largely by individual NGOs. CMC and information sharing among humanitarian organizations must increase before collaboration can increase. Yet, information sharing must be done with an understanding of shared values. Not all humanitarian organizations have the same goals and conflicting values may prevent full disclosure. For example, NGOs may wish to collaborate with military personnel for the transportation of goods, but may not wish to disclose assessment information for fear of the data being tampered with to encourage early withdrawal of aid organizations.

Questions of technology adoption must also be considered. Adoption is not just an issue of having a critical mass of users. Researchers must consider the communicative practices afforded by a system, and the number of users required to support those practices (Bradner et. al, 1999). For example, if a system is meant to keep organizations up to date on what regions have received aid and which have not, all organizations need to adopt the system for it to be useful. But if the CMC system is meant to support the handoff of supplies from one organization to another, only those organizations involved in the transaction need to use the system for it to provide benefit.

Inter-Beneficiary Communication

Current ICT systems in humanitarian logistics mainly consider how beneficiaries may be used to assess need and pass this data on to humanitarian organizations. However, this promotes dependence in contrast with moving from relief to sustainable development and to involving beneficiaries in regional development. It would make sense for humanitarian CMC to allow inter-beneficiary communication. Systems designers should consider how CMC might be used to determine what resources and transportation means beneficiaries have that may be used to aid with crisis response. One could envision a system where beneficiaries are not only asking for assistance but also offering use of their own resources including homes, vehicles, animals, and personal supplies.

Inter-Donor Communication

The Inter-Donor communication channel needs much less attention from humanitarian researchers than the other channels. Most donors live in stable areas that do not share the complexity and instability of crisis environments. While systems of communication may be considered for inter-donor collaboration tasks, they are beyond the scope of this paper.

Future Directions

Computer-Mediated Communication has the potential to revolutionize the humanitarian service sector. With organizations seeking to blur the line between relief and development and make use of indigenous knowledge, CMC solutions look promising. Researchers will need to consider both intended and unintended uses of systems deployed in crisis contexts. Yet, with well-designed CMC systems, we may begin to remedy issues of accountability, information sharing, and beneficiary empowerment within the humanitarian sector.

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