

Brainstorming for Japan: Rapid Distributed Global Collaboration for Disaster Response

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Abstract. With recent frequency of natural disasters, a global ethos of pre-emptive crisis management and the development of resilient communities have become essential. Research in disaster sociology describes an organic process of community collaboration and resource sharing that occurs during and after disaster situations. InNEED is a survivor-driven system that functions through community mobilization. The design leverages mobile technology as a medium to build connectivity at a time when network infrastructure is not reliable.

七転八起

Fall down seven times, get up eight. -- Japanese proverb

Introduction

The people of northern Japan suffered a series of cascading disasters beginning 11 March 2011: an earthquake leading to a tsunami, followed by human and technological emergencies on a massive scale. More than 13,000 people were killed, and more than 300,000 people were displaced. Damage from the tsunami led to a crisis at the Fukushima nuclear plant. Millions of Japanese, nationwide, were without power. A series of secondary and tertiary problems resulted in a

months-long crisis for Japan, with spreading societal, commercial, and financial impacts around the world.



Figure 1. Employees participated from 45 countries. Darker colors indicate more participants. Stars show the 23 countries from which employees made visible contributions. A few smaller countries are omitted for visual clarity.

Many people, nations, and organizations around the world responded with food, supplies, money, and people’s time, labor, and expertise. This note describes one response in detail: the use of social media to develop ideas for response by employees in IBM, a multinational company. We intend this note as a “case,” rather than as a formal CHI analysis. We will tell the story of the collaboration, connect that story to Related Work in CHI, CSCW, and related fields, and close with proposed topics for future research.

Palen et al. called for a vision of Information and Communication Technology (ICT) to support public engagement during emergencies [7]. In this work programme, they have documented ways in which “people are developing new practices for emergency responding, using ICT to address problems that arise from information dearth and geographical dispersion” in online communities that are defined in social rather than geographic terms [11]. They called for new designs and services that can increase citizen participation ([7]; see also [1]). Carver and Turoff argued for systems that support creativity and improvisation during emergencies [2]. Online communities are already doing this kind of work, often in a voluntary manner whose motivation has been described as “altruistic” [5,11]. Among these communities, online forums appear to be key resources [8]. In this note, we expand the scope of online communities and forums, and their types and manners of participation or contribution during emergencies.

Brainstorming for Japan

Like many people and organizations of good will, IBM acted to support the citizens and government of Japan in the early hours of 12 March, contributing technology, services, and consultation. After several weeks of intense relief work, managers at IBM began to discuss longer-term responses and proposals. They

decided to convene a voluntary brainstorming activity for employees called the Japan Forum.

Using IBM Connections, a commercial social media product, the managers created an online community for the brainstorming. In the discussion forum of that community, they posed four topics for discussion; the large response by employees allowed them to expand this list to seven topics.

Brainstorming at IBM

Employees were accustomed to conducting remote, online, asynchronous brainstorming sessions (forums) for small groups (10-500 employees during a customer engagement), medium sized groups (500-10,000 employees discussing a market segment, in some cases with client participation), and company-wide discussions (100,000 or more employees, business partners, and clients, working on new business concepts [4]). Common attributes were as follows:

- Forums were conducted in environments which supported tree-structured text-based discussions.
- Each forum addressed assigned topics.
- To create a sense of urgency, each forum had defined date/time limits. In the medium and large groups, these limits were enforced by the software, which did not allow participants to log in before or after the specified time. In the smaller, informal sessions conducted on IBM Connections, the limits were indicated but not enforced.
- Each forum had open registration to all employees and contractors. The larger forums had open registration for business partners and/or customers. The contents of the forum could be observed by anyone who had registered.
- At least 95% of participants in each of the forums were volunteers. A small core team established the problem(s)- to-be-addressed, and members of the core team moderated the forum as it took place. Often, an extended team of subject-matter experts was invited to participate; their participation was not mandatory. Any member of a forum was able to invite colleagues to join, and in practice many of the participants were in this peripheral group of completely voluntary, socially-invited contributors.

Participation was thus a dynamic activity, driven by personal interest and passion. In the Discussion, we will return to themes of interest, practice, and volunteering.

Post-forum analysis was typically done by staff with specific skills. For the smaller- and medium-sized forums, the analysts were usually members of the marketing team who had organized the forum. For the company-wide forums, a team of specialists would work for hundreds of staff-hours on many thousands of contributions.

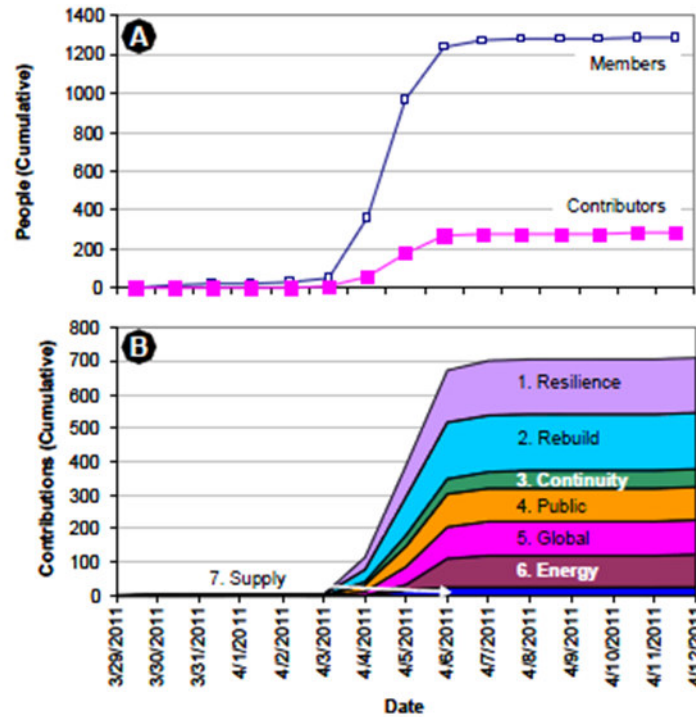


Figure 2. A. Growth of members and contributors during the forum. B. Growth of contributions in each of the seven discussion topics.

Conducting the Japan Forum

The Japan Forum was begun in the manner of a customer engagement. People in diverse organizations, who had a shared interest in emergency response, were informed of the forum, and were invited to recruit their colleagues. As we will show, the urgency of the situation led to a much larger response than a typical 100-person customer- engagement forum, with interesting outcomes.

The planners initially proposed four discussion topics: (1) Increasing resilience of Japan to future problems; (2) Leveraging technology in rebuilding; (3) Continuity planning; and (4) Addressing public perceptions. Three additional topics were added during the forum: (5) Engaging global support; (6) Managing energy consumption; and (7) Improving health and food supply chains.

Quantitative Results

Participation and Contribution. The Japan Forum was announced via an email appeal to several thousand employees, and it was featured on the IBM intranet homepage. At least some of the recipients informed additional employees. The day before the official beginning of the Forum, 47 people had registered. Four days later, at the conclusion of the Forum, 1250 people from 45 countries had registered (Figure 1). Among them, 275 people (20%) from 23 countries had made at least one contribution, for a total of 701 discussion responses (range: 1-68 responses/ person, median=1), during the three days of the Forum. The timeline of contributions is shown in Figure 2, which includes post-forum analytic contributions during the weeks after the conclusion of the forum.

Participation followed a long-tail distribution, with 135 people (52%) making more than one contribution, and only 37 people (14%) making 5 or more contributions. We note that 78 contributors (30%) wrote responses on more than one day. Thus, participation was global, with more than a quarter of the participants showing sustained interest.

Lurking. Like most commercial systems, IBM Connections recorded only active participation, with no record (other than membership) of the 1011 non-contributing participants (i.e., “lurkers”). We assume that they took an active interest, because they took the time to join the community – an effort that was as voluntary as contributing. See [6] for a discussion of how lurkers transport information from a lurked resource into active use outside of that resource.

Social Network Analysis. Except for the organizers who proposed the topics, each of the visible participants created a response to another person’s contribution. These response relationships allowed us to calculate the social network connecting contributors, across the three active days of the forum. Figure 3 shows the dramatic increase in social network connections across the three days of the forum.

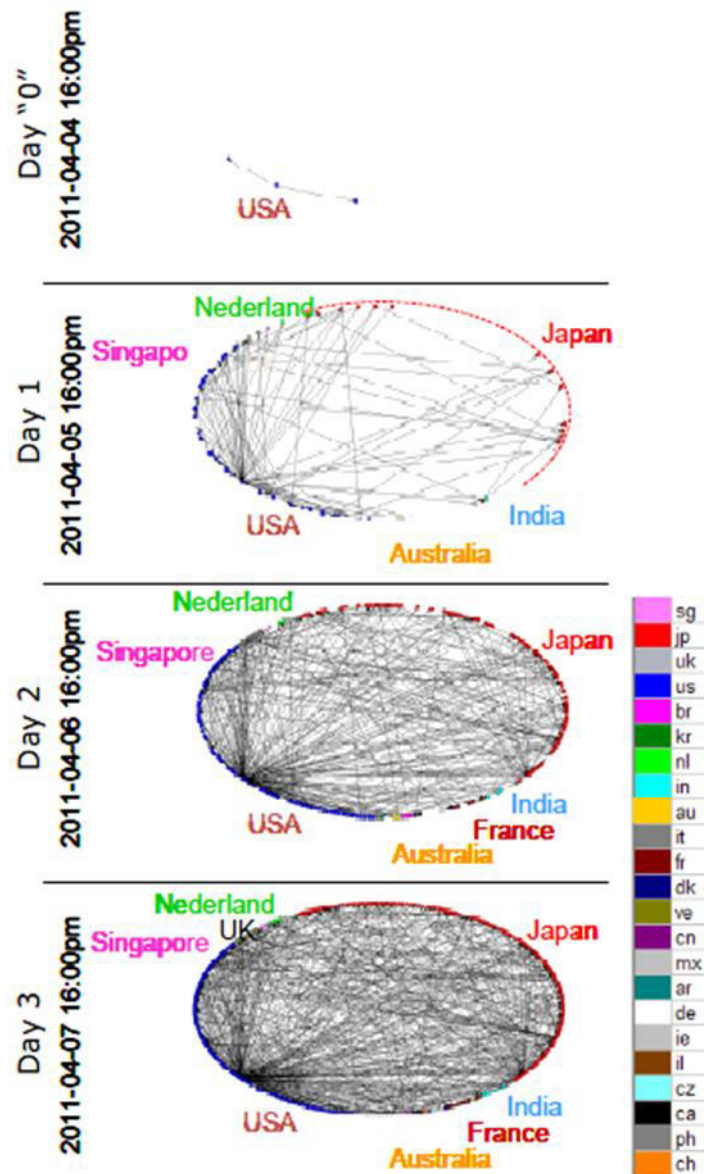


Figure 3. Growth of social network among the contributors, from “day 0” (the day before the brainstorm), to the end of the third day of the brainstorm. Country codes are from internet domain conventions (e.g., <http://ftp.ics.uci.edu/pub/websoft/wwwstat/country-codes.txt>, accessed 2011-12-20).

Qualitative Results

Employees’ contributions in the brainstorm contained rich ideas. In this note, we can only summarize what was discussed. We organize our report of the contents of the forum according to the conventional analysis of emergency management into four phases [3]: Responding (21.52% of contributions), Recovering (43.81%), Preventing (10.53%), and Preparing (49.23% -- note that 25.08% of contributions involved more than phase, so the percentages add up to more than 100%):

Responding. Brainstorming about how to respond to the current emergency involved many ideas, including:

- expanding available modeling tools to address the current conditions (e.g., using weather forecasting tools to predict radiation spread)
- repurposing existing technology for early sensing of tremors (e.g., accelerometers, disk shock-protectors)
- monitoring and modeling disease outbreaks
- managing electronic health care records during wide-scale technology outages
- providing telemedicine in the absence of power grids and reliable communication infrastructures

Recovering. While much of Japan's power generation was offline for safety checks, employees brainstormed about how to use the remaining power effectively:

- optimizing power usage at personal level and at regional level through "smart" utility management techniques
- improving power efficiencies in data centers
- using impact models to prioritize and schedule the needed rolling power outages

Information technology resources were limited, and therefore part of the "Recovering" discussion considered:

- developing more resilient networking for cities
- providing rapid-recovery for city records
- expanding these capabilities to businesses, as needed

Preventing. While earthquakes and tsunamis cannot be prevented, damage from those events can be minimized:

- providing rapid-recovery for city records
- "hardening" and strengthening existing networks and storage redundancies by simulated emergency testing

Preparing. Because of history, Japan as a nation has committed many resources to planning for future emergencies. Employees attempted the challenging task of adding to what the Japanese have already considered:

- studying best practices from other regions
- developing simulations to test resource resilience and social response

These and other ideas are currently under discussion as a kind of portfolio of potential joint work between the government of Japan and IBM; details remain

confidential to both parties. This is a typical interim outcome from these kinds of corporate brainstorms, because of the substantial resources required to implement ideas of this scale. We regret that we cannot provide further details at this time.

Related Work and Conclusion

In [1], panelist Tiantian Wang noted the need to determine “What constitutes the disaster community?” What kind of entity was the Japan Forum? If it was an online community of interest or community of practice (e.g., [10]), its four-day duration was unusually brief. If it was a virtual team (e.g., [9]), it managed to be highly effective without a manager, an assignment, a task list, or a reward structure.

Based on the IBM experiences with forums [4], we suggest that this kind of limited-duration, low-commitment idea-generation collaboration is a distinct genre of online collaboration. Its distinguishing characteristics appear to include the brief timeframe, the brainstorming atmosphere of innovative thinking [2], and the ability of volunteers to make small contributions with very low cost-of-contribution [11].

This genre extends the space of online communities that form during and after emergencies and disasters [1,2,7,8]. Most research about “disaster communities” [1] has focused on people who are directly affected by the emergency. Our experiences expand the space of action for remote volunteers from assistants/translators for people facing the emergency (e.g., [11]) to autonomous actors who collectively create new knowledge as a distinct type of contribution.

Implications for Design

Based on our case study, we suggest that systems and services to support this kind of volunteerism should allow people to join with a very low cost-of-commitment [11], and should recognize volunteers as participants whether they make visible contributions or act invisibly as engaged readers [6]. There appears to be no need for recognition, incentives, or rewards to motivate participation [4,11]. We speculate that the forums might be strengthened through a parallel community space that was designed for sociality [8,10], in addition to informational contributions.

Future Research Directions

In future research, we plan to conduct interviews to understand participants’ motivations. We also plan to ask them about what additional information they

would find useful. We hope to offer forums outside of the enterprise setting, to test replication on the broader internet.

In summary, we have described a case in which a group of volunteers was able to organize quickly to develop creative solutions in the service of other people who were facing an emergency. We showed the breadth of volunteerism, the large volume of ideas generated, and the growth of social connectedness that took place in a matter of days. We used this case to propose a distinct genre of remote collaborative contribution during crises, and we sketched some potentially important attributes. We used this analysis to propose implications for design and future research directions.

Acknowledgments

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