IBM Research Report

Brainstorming for Japan: Rapid Distributed Global Collaboration for Disaster Response

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ABSTRACT

Tragic events struck northern Japan in March-April 2011. This note presents a case study of rapid distributed brainstorming for disaster response, involving 275 contributors from 23 countries within a three-day period, conducted among the staff in a multinational company. Factors that appear to have contributed to the success of this brainstorming include: Social media that could be easily appropriated; and employee familiarity with large-scale brainstorming. The formation of this "flash-community" joins other CHI reports to point toward a new genre of rapid large-scale responses to disasters through social media.

Author Keywords

Disaster response, emergency management, social media, online community, virtual team.

ACM Classification Keywords

H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

General Terms

See list of the limited ACM 16 terms in the instructions, see http://www.sheridanprinting.com/sigchi/generalterms.htm.

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
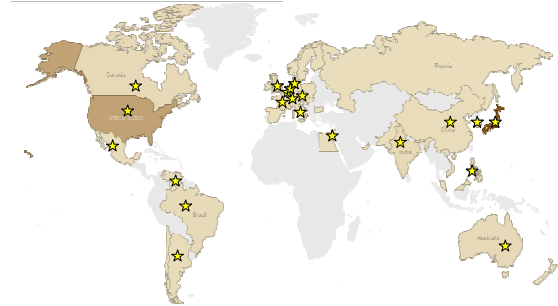

Figure 1. Employees participated from 45 countries. Darker colors indicate more participants. Stars show the 23 countries from which employees made visible contributions.

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

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. We intend this note as a "case," rather than as a formal CHI analysis. We will tell the story of the collaboration, and then connect that story to Related Work in CHI, CSCW, and related fields. We make no strong claims for causality; rather, we observe factors that were co-present, and propose topics for future research.

Palen et al. called for a vision of Information and Communication Technology (ICT) to support public engagement during emergencies [8]. 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 ([10] see also [11]). They called for new designs and services that can increase citizen participation ([8]; 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" [3,10,11]; among these communities, online forums appear to be key resources [9]. 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 JX, a commercial social media product, the managers created an online community for the participants ("JX" is an alias during blind review). In the discussion forum of that community, they wrote four topics for discussion; this list was eventually expanded to seven topics.

Brainstorming at IBM

Employees at IBM were accustomed to conducting remote, online, asynchronous brainstorming sessions (forums), for small groups (typically up to 100 employees), medium sized groups (1000-2000 employees and customers), and com-pany-wide discussions that could involve over 100,000 employees and business partners. In typical cases, small-scale forums occurred as part of a customer engagement; medium-scale forums brought together employees and members of a particular industry or market segment; and large-scale forums addressed new concepts and directions. Common attributes of all of these forums were as follows:

- Forums were conducted in one of several environments (depending on size), all of which supposed tress-structured text-based discussions.

- Each forum addressed an assigned topic.

- Each forum had defined limits, including a pre-announced starting date *and time* and a pre-announced ending date and time.

- Each forum had open registration to all employees and contractors. The larger forum had open registration for business partners and/or customers. The contents of the forum could be observed by anyone who had registered.

- Participation in the forums was mostly voluntary. For most forums, a 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, but was "encouraged." 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 contributors.

Participation *during* the forums was thus a dynamic activity, driven by personal interest and passion (in the Discussion, we will return to themes of interest, practice, and teaming).
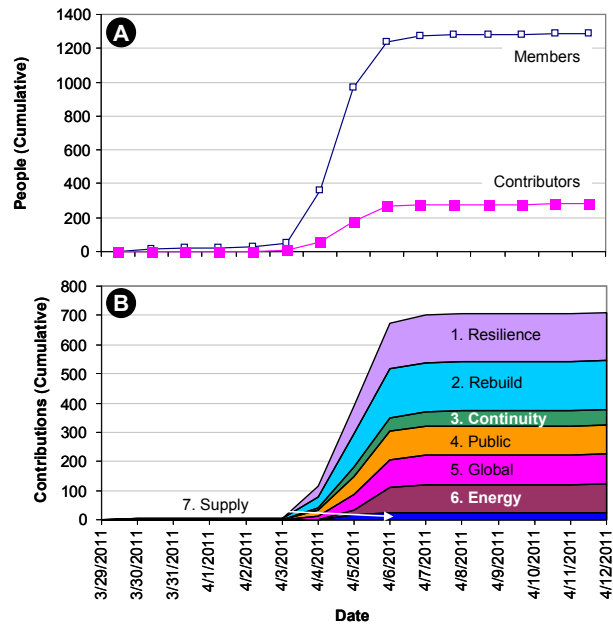

Figure 2. A. Growth of members and contributors during the forum. B. Growth of contributions in each of the seven discussion topics.

By contrast, 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.

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 thousands of 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, 1270 people from 45 countries had registered. Among them, 259 people (20%) from 23 countries had

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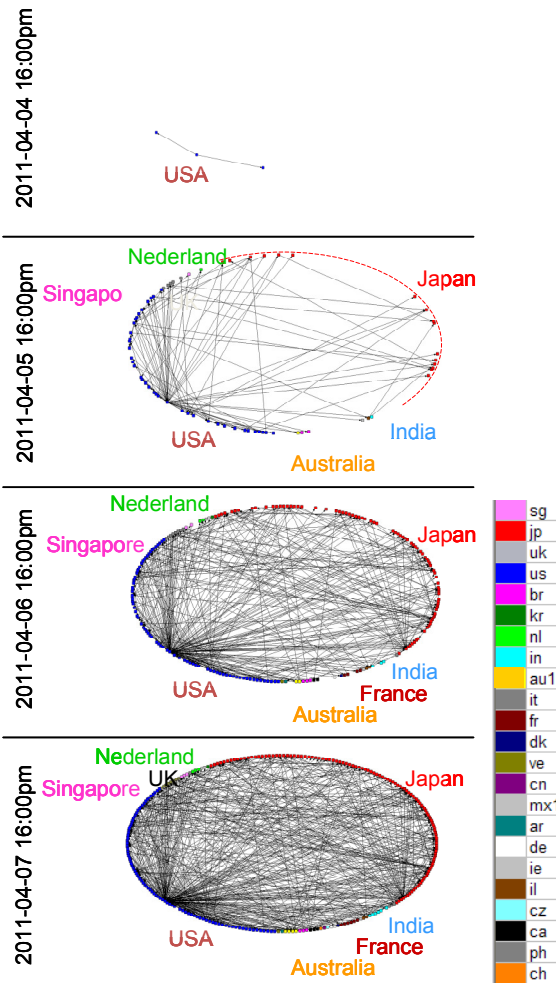|	
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Figure 3. Growth of social network among the contributors, from the day before the brainstorm (top), to the end of the third day of the brainstorm (bottom).

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 (Figure 2).

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, JX recorded only active participation, with no record (other than member-ship) of the 1011 non-public participants [7] (i.e., the "lurk-ers"). 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 [6,12] for discussions of how lurkers transport information from a lurked resource into active use with others outside of that resource.

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 three phases: Responding, Recovering, and Preparing [9].

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, or using global earthquake models to predict flooding)
- repurposing existing technology for early sensing of tremors (e.g., accelerometers, disk-protectors)
- monitoring and modeling disease outbreaks
- managing electronic health care records during wide-scale technology outages
- providing telemedicine without 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 scheduling the needed rolling power outages

Similarly, 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

Planning. 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
- "hardening" and strengthening existing networks and storage redundancies by simulated emergency testing

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., [7]), its four-day duration was unusually brief. If it was a virtual team (e.g., [5]), it managed to be highly effective without a manager, an assignment, a task list, a reward structure, any sense or rhythm or cadence, or a tangible deliverable.

Based on the IBM experiences with forums, we suggest that this kind of limited-duration, low-commitment, highly productive brainstorm is a separate 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 [1,2,4,8,9,10]. Most of the 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 the 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, and should recognize them as participants whether they make visible contributions or act invisibly as engaged readers [6,7,12]. In non-emergency forums, we have observed a need to provide links to background information about the problem addressed in the brainstorm (e.g., if the circumstances are less well-known to potential participants than the situation in Japan). These links might also provide opportunities to contribute in additional forums. There appears to be no need for recognition, incentives, or rewards to motivate participation [11]. We speculate that the forums might be strengthened through a second, parallel community space that was designed for connecting [9,11], rather than for making 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, and to experiment with various information and social resources. We hope to offer forums outside of the enterprise setting, to see if our internal success can be replicated 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 high productivity of this group, and the growth of interconnectedness 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.

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