Designing Crisis Crowdsourcing: A Dynamic Critical Interface Analysis of Crisis Response Documentation in China

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Project Description

When facilitating rescue or mutual aid during an unfolding crisis, the usability of an interface could mean life or death. 2021 and 2022 have witnessed multiple large-scale crises in China, both natural and manmade, which led to the emergence of a crowdsourcing communication genre to facilitate what Peng (2017) has called *crisis crowdsourcing*. During the record-breaking rain disasters in the provinces of Henan and Shanxi and the extensive COVID-19 lockdown in Shanghai, grassroots groups developed a variety of crisis crowdsourcing documentation, using networked digital technologies, such as cloud-based spreadsheets, WeChat mini-programs, websites. Along with other communication genres such as online data collection forms, social media chats and posts, etc., they formed genre ecologies, "an interrelated group of genres used to jointly mediate the activities that allow people to accomplish complex objectives" (Spinuzzi & Zachry, 2000, p. 172). These unofficial, dynamic genre ecologies facilitated immediate rescue of people trapped in the floods, as well as the collection and distribution of life supplies and resources to at-risk communities (e.g., food, medication). The first phase of our research examined the communication processes in this complex actor network. As the second phase, this project examines the design of the interfaces of these crowdsourcing docs, treating them as different uptakes of the crisis crowdsourcing documentation genre.

Designers of crisis crowdsourcing docs must consider various needs of users during such high-stake contexts, using creative design choices that challenge traditional genre conventions of platform interfaces. This design process is ontological and epistemic. For example, an original cloud-based spreadsheet with its conventional rows and columns could be redesigned to mimic a mobile application interface by combining rows and columns to enable better user navigation.

Participatory information technologies can help facilitate user understanding and management of environmental and health risks, crises, and disasters (Potts, 2013; Richards, 2016) by affording users greater agency (e.g., interactive user interface and opportunities for input). As a form of participatory design in the age of distributed work (Spinuzzi, 2005, 2007), crowdsourcing is defined as "an online, distributed problem-solving and production model that leverages the collective intelligence of online communities to serve specific organizational goals" (Brabham, 2013, p. xix). Core to this understanding of crowdsourcing is its networked and collaborative nature between bottom-up processes and organizational needs. Across disciplines, researchers and practitioners have explored ways to leverage crowdsourcing power effectively for community-engaged risk assessment, management, response and damage assessments (Covey, 2019, 2021; Ding, 2020, 2021; Peng, 2017; Stephens & Richards, 2020; Yang et al., 2014). Further, scholars have demonstrated how community-led crisis communication practices can help address social injustices when marginalized communities experienced exacerbated challenges (Baniya, 2022; Baniya & Chen, 2021; Ding, Li, & Haigler, 2015).

However, less effort has been made to examine how technological and organizational infrastructures can facilitate crisis crowdsourcing (Peng, 2017), such as the role played by mobile technologies and crowdsourcing platforms, as well as effective online community management and documentation maintenance across different communication channels. Using the crisis cases from Henan, Shanxi, and Shanghai, we have been researching to map out the knowledge-making process in these complex communication networks. This project is the second phase of this work where we focus specifically on the dynamic interface design facilitated by such grassroots efforts.

With the support of this grant, our project will address the following questions:

1. How have the interfaces of the crisis crowdsourcing docs evolved from the Henan and Shanxi rain disasters to the Shanghai COVID-19 lockdown mutual aids?
2. How has the dynamic interface design of different uptakes of the crisis crowdsourcing documentation genre contributed to distributive, procedural, and interactional justice (Jost & Kay, 2010)?
3. How can the scalability and sustainability of such crowdsourcing interfaces be enhanced beyond their original contexts?

Project Significance

By answering these research questions, this project is impactful to both academic and industry members of SIGDOC. It identifies the affordances and limitations of networked digital technologies in supporting crisis crowdsourcing and thus offers suggestions for better design practices that can more effectively and inclusively facilitate crisis response and relief in high-stake situations. Further, this project encourages the SIGDOC community to reconsider the rhetorical and design ingenuity of grassroots and mutual aid communities as well as the complexities of building a civic rescue network across different actors in a non-western context.

This project is situated at the intersection of crisis and disaster communication and information design. First, it updates Potts' (2013) work on the network analysis of information systems during disasters by paying attention to how innovative networked tools (e.g., location-based technologies, data-sharing applications, self-media) have expanded the crowdsourcing participatory possibilities for information design. Second, it extends the work of critical interface analysis by Sano-Franchini (2018) by developing a methodological framework that accounts for the dynamic interface development across different genre uptakes of crisis crowdsourcing documentation. Additionally, we contribute to the existing scholarship of crisis crowdsourcing and disaster documentation design (Covey, 2019, 2021; Ding, 2020, 2021; Peng, 2017) by exemplifying how partnerships, often built in ad hoc ways, result in effective risk deduction, rapid crisis response, and enhanced community resilience, especially in an authoritarian state where non-governmental sectors are constrained by political factors (Peng, 2017).

Therefore, as outcomes, we envision this project will:
1. **Advance the field of communication design** by illustrating how the interface design of crowdsourcing documentation facilitates knowledge making of grassroots communities and extra-institutional communication networks in high-stake crisis/disaster contexts.
2. **Develop a new methodological framework of dynamic critical interface analysis** that accounts for (a) the values imparted through the interface, (b) its social and instrumental affordances (Sun, 2012), and (c) how interfaces may change across different genre uptakes.
3. **Provide strategies for scalable and sustainable design practices** that effectively distribute and coordinate crisis response and activities through digital technologies across different stakeholders.

Research Plan

In this project, viewing interfaces as evolving across multiple platforms and crisis events, we propose a dynamic interface analysis that accounts for the shifting features of a given genre (crisis crowdsourcing documentation) across contexts and platforms, highlighting how designers and users can adapt cloud-based networked technologies to different contextual needs and tactically take advantage of a tool's flexibility to create values in its interface design that contributes to efficient and more inclusive relief efforts. To analyze such interface design, we draw from following data sources.

Crowdsourcing Documentation: We will examine the user interface design of crowdsourcing online documentation, including (1) three spreadsheets created with Tencent Docs to collect disaster information; (2) two mini-programs on WeChat (a Chinese social media app similar to WhatsApp) that generate location-based interactive maps to facilitate rescue efforts; and (3) two grassroots websites that display the needs of affected communities based on emergency levels and the latest updates on rescue status. We will focus on analyzing the instrumental and social affordances (Sun, 2012) of these different crowdsourcing interfaces and how they have evolved across platforms and cases. We will also explore how these interfaces contribute to distributive, procedural, and interactional justices (Jost & Kay, 2010).

Stakeholder Interviews: Since this is the second phase of a bigger project, we have already conducted interviews with participants from the Henan and Shanxi rain disaster cases and have obtained IRB approval for additional research of the Shanghai case. For this phase, we will conduct additional interviews with doc designers, volunteers, and users from the Shanghai COVID-19 mutual aid case. This interview data will supplement the interface analysis by providing insights on how doc designers and volunteers made design decisions, their reflections on the affordances and limitations of the platforms they used, as well as their suggestions for better structures, technologies, and communication design practices.

Below is the timeline of our research plan:

Timeline	Research Tasks
January-February 2023	• Conduct additional interviews for the Shanghai case
March-May 2023	• Analyze the interface and interview data • Submit a conference proposal to SIGDOC 2023
Fall 2023	• Present research outcomes at SIGDOC 2023 • Submit a progress report to SIGDOC
Spring 2024	• Draft and polish the manuscript for publication • Submit the manuscript to *Communication Design Quarterly*

Conclusion and Budget Justification

All three researchers are in the early stage of their career (pre-tenured) and work in institutions with limited research support. International collaboration across three time zones also presents additional research challenges. Thus, funding support will help compensate researchers for their time and labor.

Item	Cost
Stipend for researcher 1	$400
Stipend for researcher 2	$400
Stipend for researcher 3	$400
Total	**$1,200**

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