Introduction to the minitrack on Disaster Information, Technology, and Resilience in Digital Government

Frederick Benaben
IMT Mines Albi
frederick.benaben@mines-albi.fr

Mihoko Sakurai
International University of Japan
msakurai@glocom.ac.jp

Andrea Tapia
Pennsylvania State University
atapia@ist.psu.edu

The 21st Century has been termed "the century of disasters." Worldwide there were twice as many disasters and catastrophes in the first decade of this century as in the last decade of the 20th Century. All continents are affected, both directly and indirectly. And the trend continues, fuelled by climate change, demographic changes and social dynamics. The serious challenges facing government in cities, regions and nations of the world relate to acute shocks (such as forest fires, floods, earthquakes, tsunamis, pandemics and terrorist attacks) and chronic stresses (such as high unemployment, religious extremism, inefficient public transport systems, endemic violence, chronic shortages of food and water).

Information is among the key life-supporting essentials in a disaster response, as well as water and basic foods, which are vital to sustain lives. It is information technology these days that gives us access to most of this information. We rely greatly on it. In this sense, information management with effective use of information systems should be conducted and evaluated among disaster relief agencies. Successful information management will result in making higher situational awareness in a field that is crucial for a disaster response. It also guides us to build a disaster-resilient community, which can adapt the society to those unexpected events. These issues should be tackled at each level of the governance (international, national, regional, local, etc.), and with regards to all relevant dimensions (social, technological, interoperability, agility, etc.). This minitrack features government and disaster information management, including the development of disaster resilience communities/societies.

Eight papers have been selected that deal with any aspect of the analysis, design, development, deployment, implementation, integration, operation, use or evaluation of ICT for discussing government roles for disaster responses, disaster information management, and resilience communities. In addition, some of these papers present innovative and break-through visions regarding "disaster information, technology and resilience."

1. e-Flooding: Crisis Management Through Two Temporal Loops

Patricia Stolf, Jean-Marc Pierson, Amal Sayah, Georges Da Costa, Paul Renaud-Goud.

The paper tries to model risk management for flash flood by use of two types of loops of the MAPE-K loop model. The article mainly presents preliminary works of a promising research project.

2. Inter-organizational collaboration, information flows, and the use of social media during disasters: a focus on vulnerable communities

Stan Karanasios, Vanessa Cooper, Marta Poblet Balcell, Peter A J Hayes.

In the context of disasters and crises, how do actors use social media to provide information to vulnerable persons? Using a case study research approach, the authors attempt to show how the organizations adapt generic disaster information and contextualize it for vulnerable communities. They discuss the different social media strategies used for doing so.

3. From Declarative Knowledge to Process-based Crisis Resolution: application to Flood Management

Hanane Ariouat, Eric Andonoff, Chihab Hanachi

This article addresses the problem of deriving situation-specific crisis management plans from predefined generic plans. It proposes to use explicit representation of domain ("business") and situation knowledge, and automatically derive a situation-specific plan in BPMN, thus enabling precise

HICSS

specification, stakeholder understanding, and pre-execution analysis. The approach is illustrated with a retroactive solution of an actual crisis case.

4. Role Playing Next Generation 9-1-1: Sensemaking with Social Media in Public-Safety Answering Points

Rob Grace, Jess Kropczynski, Andrea Tapia, Eric Obeysekare, Shane Halse, Julien Coche, Aurelie Montarnal, Mike Beagles, Fred Fonseca.

This article examines sensemaking in a Public-Safety Answering Point (PSAP) through role plays with 9-1-1 telecommunicators that imagine how social media analysts can contribute to sensemaking processes among 9-1-1 call takers, dispatchers, and emergency responders. These role plays suggest social media can address information gaps that emerge when 9-1-1 callers fail to provide critical information and vice versa, suggesting social media enhances situational awareness only when integrated into sensemaking processes that synthesize information across multiple, incomplete, but complementary data sources.

5. Information Sharing and Situational Awareness: Insights from the Cascadia Rising Exercise of June 2016

Hans Scholl, Karyn Hubbel, Jeffrey Leonard.

This study reports on the challenges emergency responders faced with regard to situational awareness in a recent large-scale exercise under the name of Cascadia Rising 2016 (CR16) conducted in the Pacific Northwest of the United States. The exercise involved a total of 23,000 active participants. Over four days in June of 2016, CR16 simulated the coordinated response to a rupture of the 800-mile Cascadia Subduction Zone resulting in a magnitude-9 earthquake and tsunami similar to the catastrophic incident in Eastern Japan in 2011.

6. Application of Image Analytics for Disaster Response in Smart Cities

Neha Chaudhuri, Indranil Bose

The paper is focused on the application of image analysis to inform disaster response in smart cities. The authors perform a careful review of the literature on services proposed for smart cities (e.g., smart transportation, health, education, etc.), and identify the need for research on image analysis that can make use of images from smart cameras to identify information useful for disaster management and response teams. In particular, the focus in the paper is on identifying images that contain human bodies (part or whole), with the goal of facilitating the rescue operations. Obviously, this is a very important task, which can help save lifes.

7. Understanding resistance to resilience in coastal hazards and climate adaptation: three approaches to visualizing structural and process obstacles, opportunities and adaptation responses

Donald D. Robadue Jr.

This paper presents various problems and approaches to manage costal resilience, specifically in Rhode Island. The paper claims to employ a mixed-methods approach to create a comprehensive view. It investigates five decades of documentations regarding hazard events, studies, plans and policies around the Rhode Island aiming to reveal decisions and consequences in costal hazards. It also attempts to draw a social network map to understand stakeholder engagement.

8. A tentative framework for risk and opportunity detection in a collaborative environment based on data interpretation

Frederick Benaben, Jiayao Li, Ibrahim Koura, Benoit Montreuil, Matthieu Lauras, Wenxin Mu, Juanqiong Gou.

The paper presents a prospective framework about risk (and opportunities) identification and management in collaborative situation. The main ambition is to formalize a theoretical model for data interpretation with regards to abstract concepts concerning risks (and opportunities).