Chapter XI
Information Technology in Times of Crisis:
Considering Knowledge Management for Disaster Management

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ABSTRACT

Crisis and disaster management requires the sharing of complex information among numerous entities and individuals. Traditional knowledge management techniques are being used in government agencies responsible for disaster management, but many new technologies and practices, particularly the Internet and Web 2.0, are creating opportunities for individuals, responders, and trainers to share what they know and to acquire needed information, and prepare for the next crisis. However, the use of networked technologies, like the Internet, is still in its infancy, and the use of them diffuse, with very little cohesion among researchers and practitioners in disaster management. We argue that although the Internet is already in extensive use in disaster management, knowledge management will only be effected if top-down and bottoms-up approaches to information gathering, organization, and dissemination are implemented. The aim of this chapter is to provide an introduction to some of the many technologies, practices, and open problems for knowledge sharing in disaster situations, outline some persistent challenges, and suggest venues for exploration and practice.

INTRODUCTION

Information and knowledge are at the heart of disaster preparation, response, mitigation, and recovery. Large-scale crises require the coordination of local, regional, and national agencies, getting information to and from affected individuals and channeling the efforts of volunteers and private entities. Increasingly, the coordination of community-based organizations, individual volunteers, major disaster-relief organizations, and government and corporate entities is accomplished through the use of the Internet and other networked technologies. The sheer quantity of information that is needed to handle the impact of both human-made and natural disasters, manage situations on the ground during such crises, and learn enough to make the aftermath smoother and the "next one" less traumatic, presents numerous possibilities for knowledge management technologies and practices, where. The Internet, as in so many other contexts, is both a blessing and a curse in this regard. Its scope and immediacy make it extremely useful for disseminating information over wide areas, courting feedback, sharing information, and presenting information in multiple languages and formats (video, images, and sound, among others). At the same time, the Internet cannot necessarily be relied on in times of crisis, as it is dependent upon the persistence of other infrastructural technologies, it is not universally accessible or usable, and still presents challenges for the secure verification and validation of information.

Nevertheless, the Internet and knowledge management (KM), in general, have an increasing role to play in disaster mitigation and recovery at all levels, local to global. Both will be essential in coordinating the actions of human beings with no common authority who must cooperate around hastily formed networks (Denning, 2006). However, making the most of these technologies will require some rethinking of KM, which has primarily been shaped by and for the needs of the private sector. Such efforts have been characterized by the boundedness of the organization in which KM is deployed, relative coherence of goals and plans, and the ability to take for granted the kinds of knowledge and skills to be captured and disseminated. However, the Internet, and disasters themselves, of course, are not bounded. Since KM has traditionally been tied to specific organizational objectives, it is a challenge to consider how its tenets and technologies can be used in different cross-organizational and informal contexts. It is also necessary to reconsider the context of design and use, since most approaches to KM have relied on static processes and knowledge basis of metadata and described documents (Butler, 2003), neither of which holds in the context of disasters.

For example, capturing and displaying the kinds of information needed by officials who are charged with mobilizing resources and assessing impacts require large quantities of free-text data and text drawn from reliable sources. Secure transmission of classified data may be required and is not always possible over the Internet. At the other end of the scale, families and individuals affected by a disaster may need to use the Internet to contact family and friends, apply for benefits, or scan and post photos of missing friends or family members. In some cases, the affected individuals may not be at all familiar with accessing the Internet. In short, disasters and disaster recovery challenge human and technical systems and what we know about infrastructural technologies, social technologies (those that are designed and used specifically for collaboration and communication), systems and information design, and the organization of information.

At first glance, KM in the disaster management setting may seem most applicable to formal organizational structures (such as local, regional, and national government), but we argue that it is a valuable technology for the kinds of grassroots

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