Information Science and Technology in Crisis Response and Management

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INTRODUCTION

Emergent technological innovations in robotics and miniaturization of robotics, drone technologies, acoustical sensors, and others are revolutionizing the effectiveness of crisis response and management efforts, on smaller local events, and in combination, may be applied to larger disaster events such as major community or regional crises. These have also been supported by advances in tracking, communications, information dissemination, identity verification, and location technologies developed over that past decade since Hurricanes Katrina and Rita devastated the central populated region of the United States and Central North America. The combination of these technologies show promise of rapid intervention and rescue, within the most devastated areas affected by major environmental and man-made disasters as they are scaled up to address larger population supports. Location and allocation of resources to the individuals, families, and populations of need may occur nearly unimpeded by obstacles, debris, contaminants and human first responder high risk environments. As these technologies are systematized and develop some level of autonomy in technological problem solving, they are likely to improve overall survivability of populations at risk in the most disaster fragile of environments.

BACKGROUND

Early efforts to link crisis management and information technology were concerned with the protection and maintenance of data within private business organizations. Businesses' have become dependent on technology to perform work, distribute products and improve productivity and efficiency. Loss of technology functions and critical information could cause irrevocable damage to a business. Therefore crisis management in the business sense has meant anticipatory planning for disruptions and protecting data and process critical for business success. The use of experts within a domain of business services coupled with domain decision makers and gathered into crises management teams; has been highly useful in considering critical scenarios of information or other critical processes disruption or loss. Constructing anticipatory action plans has proven to be a key part of adequate preparation for response, though these must be updated as situational contexts and key personnel change (Esbensen & Krisciunas, 2008).

Approximately a decade ago, in North America the major disasters of Hurricanes Katrina and Rita (Hurricanes: Science and Society, 2015) and there combined effects on a region of the south central United States were heavily televised, in part because of the urban location of the disaster in a modern and well known city. Major humanitarian service providers such as FEMA and the American Red Cross began to grapple with the scale of information needed and service provision possible for such large scale disasters and began seeking community and academic partnerships with corporate information technology providers, the defense industry, uniformed military service providers (especially those engaged in search and rescue efforts) and governmental agencies to improve crises response and management, for disasters of scale (Hurricane Katrina Disaster Relief, 2015).

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Since this time several additional cataclysms have increased awareness for the need to look at international and global response systems involving information technology, relative to preparedness, systemization, planning, pre-positioning of resources and equipment, logistics and distribution capacity in the management of crisis and disaster management. Public attention has been galvanized by devastating natural disasters such as; earthquakes in Pakistan in 2005 and in Sichuan China in 2008 and again in Haiti in 2010, the Tohoku earthquake and tsunami striking Japan in 2011, Cyclone Nargis that struck Myanmar in 2008 and by recent recollections of earlier but recent large scale disasters prior to the North American hurricanes of 2005 such as; the Sumatra tsunami of 2004, and the Iran earthquake of 2003, and several earlier to these and many others since (Lists of Disasters, 2015).

CRISIS RESPONSE AND MANAGEMENT: TECHNOLOGY CONSIDERATIONS

Crises and disasters are sudden and unforeseen. Each is serious, disruptive, overwhelming and often exceeds capacity to restore order and normalcy in any expected time frame. However, crisis or disaster events may occur with some frequency and predictability, and standardized responses may be thoughtfully and consistently applied. Others may be anticipated to occur occasionally but irregularly, and require a level of creativity and innovation over a short period in response. There are of course, improbable and unexpected crises and disasters which occur infrequently, but of which there are no precedents or examples to follow, and for which we have little or no prior experience. These are often widespread and devastating occurrences, requiring longer term determination and resolve to manage and to overcome or restore some level of normalization. Technology and information based systems may be designed to address each, as these relate to specific probabilities for their occurrence, and with attention to scalability of responses as needed for each type of crisis or disaster.

SWOT (Strengths, Weaknesses, Opportunities, and Threats) Analysis for Institutions

Though there are a number of possible and foreseeable crises that may affect any organization, information science technology is emerging as a critical crisis response consideration. Economic downturns, loss of funding, loss of physical and human assets, and employee litigation (Crisis Management, 2016) may all be tied to the consistency sustainability and privacy issues associated with information technology management protocols and continuity. A strategic planning method that may be quickly used by employees not fully familiar with an organization is to develop a simple SWOT plan of key and critical inquiries relative to information technology management or other strategic plan, crisis response initiative of the organization. Some possible lines of inquiry and planning for information technology management are given in Table 1 below, these should be strategically prioritized and determined both internally and externally:

Information Science Technology: Institutional Crisis Response and Management

Crisis response and management as related to institutions, or business, information science and technology requires crisis management teams are often designated in advance of a crises and focus crisis and recovery plans on avoiding a crisis, preparing and planning for crises, identifying threats and critical systems for protection, training key personnel for crisis events and recovery, communicating plans to organizational members, and reviewing and updating plans and disseminating crisis response guidelines. Phases of institutional Crises Stages (Fink, 1986) involving information technology have been identified as: