THE STATE OF SECURITY: THE GROWING PRESENCE OF EMERGENCY MANAGEMENT TECHNOLOGIES ON COLLEGE CAMPUSES

Jessica L. Buck, Jackson State University

Abstract

Due to growing threats of terrorism and ongoing natural disasters, emergency management is at the vanguard of societal concern. With such concern, it is essential that disasters or incidents (planned or unplanned) be managed in a way to cause less harm to people and the environment. Emergency and disaster concerns impact federal, state and local government entities; public and private sector organizations; the general public; and the academic community. However, technological innovations may be incorporated to improve the effectiveness and efficiency of situations in which potential emergency events can be minimized or completely alleviated. Technological systems, such as human-computer interaction, can make emergency response easier and allow entities to adopt a user-centered systemic approach so that anyone can use the system. Nevertheless, technological integration with emergency and crisis preparedness and management helps to reduce the uneasiness, possible loss, and costs associated with natural and man-made disasters.

This study examined the types of emergency and crisis incidents that have impacted the international and national general public and college communities. In this paper, the author describes some of the technologies that help to reduce or alleviate potential man-made or natural hazards.

Introduction

In the wake of earthquakes, hurricanes, tornadoes, terrorism and other natural and man-made disasters, emergency management is a pertinent issue that is at the forefront of societal concern. The International Association of Emergency Managers defined emergency management as an agenda where communities decrease danger and handle catastrophes [1]. Emergency management also emphasizes how risks should be avoided. In 2007, the Federal Emergency Management Agency (FEMA) provided the definition of emergency management as, "the managerial function charged with creating the framework within which communities reduce vulnerability to hazards and cope with disasters" [2]. Such disasters may be natural (e.g., hurricanes, tornadoes, typhoons, tsunamis, earthquakes, etc.), or man-made (e.g., terrorism, bio-terrorism, pandemics, school violence, etc.). Regardless of the type of emergency event, there is a dire need for earlier detection and warning to minimize or eliminate altogether the effects of the disaster.

With such considerations, promising inclinations and technologies in emergency response systems are essential for the continuous safety efforts for both the general public and the academic community. Carver & Turoff [3] contend that emergency response systems and processes must be improved with effective and efficient technologies. For example, emergency response information systems and governments should make human-computer interaction easier and adopt a user-centered systematic approach so that anyone can use the system. With this being a concern, there is a demand for more highly skilled people to operate and manage the complex systems.

People with such skill sets in the emergency management information systems must be able to absorb information quickly and discern relevance and reliability to determine a proper course of action for an emergency incident. In an emergency, the computer interface should enhance an emergency responder's capability to plan, train, respond and evaluate the emergency. The human and computer interaction's aim is to provide a means of predicting possible emergency events, securing accurate and timely information, disseminating information and making continuous improvements in emergency management systems. Human and computer interaction is a needed integration, and other technologies serve as an integral facet in the on-going evolution of emergency management [3].

Need for Incorporating Technology into Emergency Management

Because of public anxiety due to the associated loss and cost of disasters, four segments in emergency management must be in place: mitigation, preparedness, response and recovery [4]. According to FEMA, mitigation is the attempt to prevent hazards from developing into disasters. Mitigation further aims to reduce the effects of disasters once they occur, and it emphasizes long-term measures for reducing or eliminating long-term threats. Preparedness entails an unre-

mitting cycle of planning, organizing, training, equipping, exercising, evaluating and improving activities to ensure successful synchronization. Response refers to the mobilization of the necessary emergency services and first responders in the disaster area. Recovery involves the restoration of impacted areas to their previous states. Recovery focuses on rebuilding destroyed property, re-employment and the repair of other pertinent infrastructure. In addition, recovery may involve mental and emotional restoration, where people regain an emotional soundness in the wake of a disaster. In adhering to these segments, technology serves as an asset during times of anguish. Useful technologies assist in

- identifying points where emergency management is required;
- identifying new technological applications to enhance emergency management systems;
- evaluating technology's effectiveness in time reduction in an emergency;
- providing enhancements for community and campus emergency response systems; and
- providing information on strategies to further enhance technology's integration with emergency management.

Although technology has greatly advanced in recent decades, emergency management continues to render improvement. According to Mendonca et al. [5], inventiveness and the development of impromptu organizations can often nullify the benefits of new technology. To ensure that emergency management information systems are able to reach their full potential, they must be designed to allow flexibility in their use, thus leaving room for inventiveness. They further indicate that communication and information technology may be classified according to the combination of process structuring, communication and information processing support it best provides and the emergency response system required.

Where Emergency Management is Required

Emergencies are generally unexpected, and most are presented without fair warning. It is the responsibility of the highest levels of government to the average citizen to provide individual, community, national and international safety. Such responsibilities may fall within the realm of storing non-perishable food items, water and batteries in preparation for a forecasted storm, to having emergency respondents and incident commanders posted with plans of actions before and during a sudden incident. Effective emergency management depends on methodical integration of emergency schemes at all levels of government and non-government involvement [6]. Activities at each level

(individual, group, community) impact the other levels. Frequently, the responsibility may be placed on governmental emergency management with the institutions for civil defense or within the conventional structure of the emergency services. In the private sector, emergency management is occasionally referred to as business permanence planning. This is the development and justification of a practiced logistical plan for how a group or institute will re-establish itself, either partially or completely, within a prearranged time after a disaster or extended disruption. Nevertheless, adequate use of innovated technologies positively impact efficiencies when considering time reduction before and after a disaster.

New Technologies and Time Reduction

One integral technology in planning and time reduction is the use of the Internet. The Internet performs numerous capabilities that are vital in emergency management. According to Ozceylan and Coskun [7], Internet utilization aids in heightening awareness through Web pages that inform citizens. Internet utilization allows opportunity for community discussion groups; making disaster plans available online; providing educational disaster management material to schools, libraries, other community related places; and providing support for training or drills that can be used to support cultural factors. Ozceylan and Coskun further insisted that the development of a specific type of information system would better assist in minimizing or alleviating some emergencies, but that such systems may not improve response times of those dispatched to the emergencies. However, technology and information system utilization will increase the country's progress level, and it will promote more favorable socio-economic situations for disaster management for future implementations. Nevertheless, governments and administrators of local jurisdictions must support technology in every area. Databases may provide various forms of emergency-management-related data to policy makers. There are, though, departments designed to follow new developments in disaster management areas. In addition, networks with other countries' emergency management organizations aid in creating citizen groups to check to see if political decisions might be considered political factors.

In addition, Ozceylan and Coskun affirm that databases, decision-support systems, knowledge-based systems, GIS, Web-based databases, satellite systems, digital libraries, satellite communications, remote sensing, source data automation systems, data collection systems, simulations, intelligent systems, archived data for past disasters, transaction

processing systems, simulations, communication systems and software, management information systems, intranet, data mining, data warehouses, resource management and planning systems are some examples of information systems and technologies which can be used to support emergency management processes. These all may be used collaboratively in enhancing emergency response efforts. Another technological approach that may be used in emergency management initiatives to reduce disaster risk and to increase response quality is Embedded Intelligent Real-Time Systems (EIRTS) [7].

Technology Application

The Main purpose of utilizing information systems and information technology (IS/IT) is information sharing among different entities and organizations; resource (equipment, man power, money) planning and management; decision support for upper-level administrators or managers; forecasting; effective and fast communication; administration and coordination of organizations and other related agencies; public education (Internet); response-team training; simulations of different disaster scenarios; damage assessment; and informing the public during and after disasters.

Better hardware, software and telecommunication networks for disaster management, connection among different agencies and offices, Internet-based systems and backup systems can be used to support technological factors. The existing literature maintains that IT such as computer networks, virtual reality, remote sensing, geographic information systems (GIS) and decision-support systems are enhancing disaster communications. . Internet/intranets and spatial analysis systems may assist during the mitigation and preparation phases. Satellite communications, remote sensing, cellular and radio communications may also be used during the emergency phases [8]. With the latest technologies rapidly growing in implementation, there is still innovative thought on how college campuses may further benefit.

Technology on College Campuses in Emergency Events

In light of the Virginia Tech massacre in 2007, Johnson and Keen [9] indicated that the university's law enforcement re-evaluated security plans in the aftermath of the event. Such utmost concerns rapidly moved to campuses in Delaware and North Carolina, where patrols increased to calm faculty and students, and to ensure that the act was not repeated on campuses. Soon, college campuses throughout

the U.S. began to make efforts to permanently improve emergency plans. College and law officials assessed campus security programs, which caused a review from the Columbine High School shooting massacre and the University of Iowa shooting incident, which occurred 16 years prior to the 2007 Virginia Tech shooting. To aid in early warning and possible prevention, technology may be an integral facet to promote progressive efforts.

In 2007, Swartz and Hopkins [10] expounded on advanced technology serving as emergency warning devices. The authors reflected on the Virginia Tech shooting where there were 33 deaths. In identifying that there were four email alerts, it was suggested that text messaging may have been the best method of warning students. In 2007, at least 35 universities and colleges had an emergency system which alerted students of planned or unplanned incidents. In addition to e-mail and cell-phone communications, social networking is used to announce emergency events. Today, all campuses have this and other sophisticated technologies to aid in the safety of students, faculty and staff.

Summary

Emergency systems must be improved with effective and efficient technologies in order to meet such societal concerns. Systems such as human-computer interaction can make emergency response easier and allow entities to adopt a user-centered systemic approach so that anyone can use the system. Nevertheless, technology must be integrated with emergency preparedness to reduce the uneasiness, possible loss, and costs associated with natural and man-inflicted disasters. This study evaluated the integration of technology and activities with recent concerns of emergency management. With such events generated by natural or man-made disasters, valuable approaches must be enforced to reflect the current state of technology. Such innovations will assist in developing a deeper admiration, which reflects personal emergency consideration, producing exclusive and constant awareness.

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Biography

DR. JESSICA L. BUCK is an Assistant Professor of Technology in the Department of Technology (under the College of Science, Engineering, and Technology) at Jackson State University in Jackson, MS. She also serves as the Program Coordinator of the Technology Education Masters Degree Program. In addition, she serves as advisor of the Jackson Sate student chapter of the Association of Technology, Management, and Applied Engineering (ATMAE) and the trustee for the Delta Beta chapter of Epsilon Pi Tau Technology Honor Society. Dr. Buck currently serves as Vice-President of the Student Division of ATMAE (2011-2013). Dr. Buck may be reached jessica.l.buck@jsums.edu.