Information and Communication Technology (ICT) for Emergency Services: A Survey of Texas Emergency Services Districts

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ABSTRACT

While most would suggest that more effective use of ICT bodes well for emergency services, there are issues associated with the introduction of such use. To explore these issues in Texas, the authors administered a survey of Texas Emergency Services Districts (ESDs). These districts are charged with delivery of emergency and medical services throughout the state and receive modest tax revenue to fund operations. The results show that in Texas ESDs political and organizational factors are important. Budgets are closely related to the political process in the ESDs, so politics plays a central role. Organizational culture and prevailing sentiments in Texas ESDs are generally supportive of ICT adoption and use. While ICT is seen as essential to service delivery, survey results show that problems of interoperability of communication systems is an issue. The most commonly used ICTs include email, GPS, Google Maps, standard web pages, Wi-Fi networks, smart phones, reverse 911, emergency alerts, Facebook, and database management. GIS, You Tube, VOIP, Cloud Computing, Twitter, LinkedIn, Digital Billboards, 311 for non-emergency disaster, 3D mapping, blogs, podcasts, and Wikis were used by few ESDs. When social media are used, they are not used in such a way as to encourage wider participation of the community in information gathering rather they are used only as an alternative traditional delivery service from the ESDs to the community. Data analysis of past events is used to improve performance. Data management issues of significant concerns include privacy and security.

Keywords: Emergency Management, Emergency Services Districts (ESDs), Information and Communication Technology (ICT), Local Government, Survey Research

INTRODUCTION

The use of information and communication technology (ICT) by those who provide emergency services is becoming a very important factor for public service delivery. While most would argue that greater and more effective use of ICT portends well for emergency services, there are also issues associated with the introduction of such use. ICT can be expensive. It can alter the traditional balance within organizations used to dealing with one “tried and true” way of doing

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things. Its introduction can have political consequences. In understanding the use of different information and communication technologies, it is important to explore the variety of use as well as how a particular technology is put into action. One widely debated role today is that which may be played by social media or Web 2.0, especially in terms of allowing full citizen participation in disaster activities. It is also important to be able to understand the way that those who deliver emergency services manage the data and knowledge that ICT provides, especially in terms of potential threats for data security and privacy.

To explore some of these issues in one specific state, we undertook a study of the Texas Emergency Services Districts (ESD) in the United States. In Texas, providers of emergency services and fire fighters are organized into local government organizations called ESDs. They provide fire protection, emergency medical response, or both. With the massive population growth of Texas in recent years, the state has outgrown the traditional reliance on the provision of emergency services through the sole use of volunteers. ESDs were created by the state legislature to provide a steady source of funding for a more professionalized emergency services delivery in the state. The paper reports findings regarding the use of information and communication technology by the Texas ESDs and the ramifications of that use. Drawing on a survey of officials within the Texas ESDs, we explore the use of ICT by the Texas ESDs.

This study is different from the existing research with its focus on case studies on the adoption of a specific technology and its impact on emergency management. While this study examines through a survey, more generally, what are the technologies currently adopted and what factors influence their use, something that we have less knowledge about.

This paper is divided into several key sections. The second section provides a literature review, identifying four factors important in the literature on the adoption of ICT in emergency management. This study then takes these four factors and discusses the survey research methods. Following this section, the findings of this paper are then discussed. The conclusion discusses the key findings and relates them back to the literature.

Literature Review

There are four factors identified in the literature that are said to impact IT and emergency management, namely political and organizational factors, ICT used for emergency management, social media and emergency management, and knowledge and data management. In this section, each of these four areas will be reviewed.

Political and Organizational Factors

Existing research on emergency management shows the importance of the political and organizational environment of the local government (Somers & Svara, 2009; Rahm & Reddick, 2011). Examining Hurricane Katrina, Waugh (2006) argued that the outcome of elections showed the political cost of the lack of response to this disaster by public officials. It is very difficult to separate politics out of emergency management (Wamsley & Schroeder, 1996; Gerber, 2007). An example of the politics of emergency management can be seen in the placement of Federal Emergency Management (FEMA) trailer parks (Davis & Bali, 2008). FEMA is responsible for choosing, evaluating, constructing, and maintaining trailer sites, but the park cannot be built without the approval of the local government. FEMA trailer parks are not typically likely to help the electoral needs of local officials running for office, and are most likely to get significant opposition.

Manoj and Baker (2007, p. 52) argue that in emergencies “...sharing and dissemination of information is both critical and problematic beginning with whom to trust in unfamiliar settings.” These authors argue that this is because of organizational challenges; when emergency responders are accustomed to hierarchy then centralized decision-making must work in a more dynamic and ad hoc setting if a disaster strikes. There are various collaborative
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