Interoperability for First Responders and Emergency Management: Definition, Need, and the Path Forward

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Abstract

A definition of a culture of interoperability between members of the first responder community is the subject of this review. The justification for, keys to, and roadblocks preventing the creation of an interoperable culture within emergency response are considered. Also considered is how such a culture may be cultivated. Finally, the public policy context of training in the first responder community as a tool to create interoperable communities is discussed.

Keywords: cross-disciplinary, awareness, interoperability, communities

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In the United States, the management of and response to a disaster usually involves multiple entities and organizations from the federal, state, and private sectors. Thus interoperability is important to successful disaster preparedness and response. The engineering definition of interoperability is “the ability of two or more systems or components to exchange information and to use the information that has been exchanged” (IEEE 1990). While this is a useful definition for infrastructures such as computers and telecommunications, it falls short in dealing with the human and organizational factors during a crisis response.

Crisis response encompasses technical, organizational, and cultural interoperability. Crises are unpredictable and endanger large segments of a population, often requiring focused or tailored responses. This creates the need for flexibility, preparedness, and adequately trained personnel capable of dealing with all-hazards events. Training should develop responders capable of rapidly assessing threats and acting accordingly, using ethical measures for mitigation, containment, and recovery.

Interoperability involves commonality of processes and technology, facilitating interactions between responders, stakeholders, and volunteers (Waugh and Streib 2006; Harrald 2006). Coordination through interoperability is necessary for efficient and timely crisis response. So far, developing the necessary process and infrastructure for crisis response has proven to be difficult (Waugh and Streib 2006).

The shared understanding across the many different first responder and emergency communities is more than a common language and information sharing protocols.

Unfortunately, the importance for interoperability is not fully understood by today’s crisis managers. While most grasp the necessity for technological systems interoperability, there is insufficient appreciation of interoperable organizations and personnel. The scope of interoperability has been defined by Lerner et al. (2005) as “All aspects of collaboration and interaction needed to effectively prepare for, and respond to, disasters and other public health emergencies.”

A robust relationship among the stakeholders should be encouraged and developed before a disaster occurs. It is unreasonable to expect that responders can merely be told to cooperate in order to achieve cooperation. Before a disaster occurs, operators from all relevant agencies must work together, building relationships and trust. Joint training during disaster drills and simulations, reaching across domains, are useful in developing a culture of interoperability.

Cultural changes must be made to operational guidelines to facilitate interoperability between individuals and agencies (Barbera and Olson 2004).
While executives may be willing to suggest that responders be more cooperative, they must also craft new policies and protocols that can enable that cooperation.

Integration will continue to be restrained across disciplines and regions as long as crisis responders are not privy to information pertaining to the total response capacity and situational awareness. This includes knowledge of transportation, patient care, medical supplies, and manpower assets that each provider may have at its disposal. Integration will remain elusive until active steps are taken to achieve transparent communication and information sharing between concerned participants. Integrated responses require collaboration between police, fire, emergency medical services, military responders, and public healthcare providers at all organizational levels. First responders from various agencies and jurisdictions must be able to reinforce each other to meet the challenges presented by different crises.

One of the greatest difficulties facing the crisis management community arises from the vertical and horizontal fragmentation in today’s governing organizations (McConnell and Drennan 2006). Fragmentation fosters roadblocks to crisis planning and response. Horizontal fragmentation can be overcome through the development of interpersonal relationships between actors in the first responder community. The challenges presented by vertical fragmentation, however, require more formal solutions that address the organizational and cultural issues presented by different agencies. The response most likely to be successful is one that can utilize both an informal and formal approach.

Another significant obstacle to interoperability is the reliance on government funding programs. Many funding programs are competitive and make it difficult to develop the relationships essential for interoperability. This adversarial culture is in direct contrast to collaboration and cooperation (Barbera and Olson 2004). The complexity of these obstacles brings to focus conflict between integrated contingency planning and the non-uniform realities of public, private, and government organizations (McConnell and Drennan 2006).

Political maneuvering, poorly defined command systems, and uncertainty about which roles and responsibilities are held by which organizations are also barriers to crisis response. They put emphasis on the need for a clear command structure, noting that ambiguity could cause significant disorder in a crisis, hindering effective response.

Training the first responder community effectively presents numerous difficulties (Livet et al. 2005). The great diversity across disciplines is one of the major causes of these difficulties. Impediments that
arise from training individuals in highly specialized fields with differing levels of education and at times contradictory cultural ethics are formidable.

Along with the need to train first responders there is also the need to train the emergency management professionals from support organizations in fields such as finance and administration (Tierney 2007). All parties involved in a crisis must not only be trained to a high level of proficiency in their given field, but must also possess awareness of the other responders. Training should encompass all aspects of crisis planning, response, recovery, and mitigation (Tierney 2007).

Another benefit of training is increased awareness of the special needs of vulnerable populations. Examples are rehabilitation clinics and retirement facilities. The service providers to vulnerable populations will be better able to provide continued healthcare if they are aware of the timetable of response and just what external assistance can be expected (Stahmer et al. 2007).

By uniting all communities, there is a greater opportunity for mutual benefits to be derived. Interdisciplinary training may also assist healthcare providers in non-crisis situations such as immunizations, where responders can act as reserve healthcare providers in limited capacity. Also, through type-specific interdisciplinary training, such as violent situations, we can provide responders with the cross-agency awareness that has been identified as essential to effective crisis response (Vernon 2007).

Finally, it must be recognized that not every type of crisis can be anticipated. However, responders can be made ready to address these through effective training. The key to successful crisis management and response is the creation of cross-discipline and interagency integrated response. Responsible organizations at the federal and state levels should provide resources and opportunities and promulgate policies to ensure interoperability training and teamwork in disaster response.
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