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Usability, content, and connections: How county-level Alabama emergency management agencies communicate with their online public

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ABSTRACT

Emergency Management Agencies (EMAs) in the U.S. operate at federal, state, and local levels, each with a common purpose “to prepare for, prevent, respond to, recover from, and mitigate the effects of incidents” (Homeland Security, 2008). As Homeland Security (2008) explains, local EMAs (LEMAs) lay the groundwork for prevention and other activities, coordinating with nearby LEMAs and local entities, including private and non-governmental organizations. LEMAs have been studied little; most research on online LEMAs and State Emergency Management Agencies (SEMAs) has been limited to website content, providing an incomplete picture of how they provide online service to the public. Bertot & Jager argue that functionality, usability, and accessibility are critical elements in evaluating e-government, noting that if users cannot get to or find the content, the content becomes irrelevant. This study contributes to addressing this gap by evaluating Alabama LEMA websites, based on a combination of content rubrics used in prior EMA studies and usability heuristics, factors that can affect user trust, and thus a site's usefulness. It also looks at how Alabama LEMAs are using social networking on their websites.

1. Introduction

U.S. Emergency Management Agencies (EMAs) operate at federal, state, and local levels, each with a common purpose “to prepare for, prevent, respond to, recover from, and mitigate the effects of incidents” (Homeland Security, 2008). As Homeland Security (2008) explains, local EMAs (LEMAs) lay the groundwork for disaster prevention and other activities, coordinating with nearby LEMAs and local entities, including private and non-governmental organizations. Typically, in emergencies, LEMAs begin the response process, and state-level EMAs (SEMAs) help coordinate wider networks of support, including with other states. All LEMAs in Alabama are county-based, although they sometimes partner with a municipality within the county. When states' resources do not suffice for an emergency, governors can request assistance from the Federal Emergency Management Agency (FEMA).

Facilitated in part by the rise of the Internet and World Wide Web, by 2001, governments at all levels in the United States were beginning to implement e-emergency management, leveraging computer-based communication tools to address a variety of emergency planning concerns, including communicating with the public (Green III, 2001). Green III (2001) argued that the move toward e-emergency management was critically important both as an internal communication tool

and as a means to communicate with the public. Green III (2001, p. 78) also cautioned that emergency managers face a significant challenge in sorting through the ever-increasing amount of information available and deciding, “what [information] do you trust?” The issue of trust is not just a question of what information the emergency manager should trust, but also raises concerns about what information the general public will trust. Ten years after Green's study, however, with 87% of American adults online (Pew, 2014a) and 74% using social media (Pew, 2014b), local-level governments have had mixed success in communicating effectively with their online constituents. For example, Huang (2006) argued that centralized county websites (web portals) enhance county e-government usability—the ease with which a user can accomplish a task, such as finding information, on a website. Yet Huang found that, nationally, over 43% of counties failed to use a portal-based approach. Over six years later, Youngblood and Youngblood (2013) found that over 40% of Alabama counties had not adopted portal-based websites. Website usability has the potential to affect more than just ease of use, and it is a critical factor in how credible and trustworthy users perceive a website to be, regardless of whether the site is commercial (Fogg et al., 2003) or governmental (Huang, Brooks, & Chen, 2009). Previous research on Alabama local government websites has revealed substantial usability and accessibility (usability for disabled

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users) problems at both the municipal (Youngblood & Mackiewicz, 2012) and county levels (Youngblood & Youngblood, 2013).

Alabama LEMAs are well suited for a case study such as this one. Alabama frequently ranks in the top 10 states for declared disasters (a disaster in which a state/tribal government requests federal assistance) in the United States and averaged 1.5 declared disasters between 2007 and 2016 (FEMA, 2017c). In December 2015, every Alabama county went under a flash flood warning within a 2–3 day period, and the resulting damage from the storm system led the state to declare several counties disaster areas. Given the frequency with which Alabama is subject to these natural disasters such as tornados, hurricanes, and flooding, Alabama LEMAs likely need to turn to the Internet to communicate with some members of the public. Building on prior research on local-level e-government in Alabama and national-level studies of state and local EMAs, this study examines how Alabama LEMAs communicate with the public online. This examination includes whether or not Alabama LEMAs use the web as a communication tool, adoption of social media, the quality of e-emergency information found on LEMA websites, a heuristic evaluation of LEMA website usability, an examination of best coding practices such as the use of valid HTML and CSS, and an analysis of website accessibility based on a combination of automated coding and code inspection.

2. Emergency management agencies

LEMAs are a critical element of the national emergency response system because these organizations know their communities, have worked to develop plans to mitigate and respond to local emergencies, and are the first on the scene of those emergencies. One of their main functions is providing information to the community, including local media and the general public. While typically referred to as a county or city's "Emergency Management Agency," they are occasionally given other titles including the Office of Civil Defense, or Homeland Security; each LEMA in Alabama, though, has "Emergency Management" in its name. LEMA organizational structures vary by community and can range from a large staff of full-time employees in a major metropolitan area to a single volunteer in the case of a small community (Lindell, Prater, & Perry, 2006). These disparities equate to, among other things, varying resources for establishing and maintaining websites.

While LEMAs currently play a prominent role in emergency planning, that has not always been the case. In a 1985 report to FEMA, Quarantelli (1985) reported that community leaders had a mixed track record in how much importance they attached to their area LEMAs, and that in several unidentified emergency situations, local officials completely ignored their LEMAs. Quarantelli suggests that part of the problem may have been that local governments were unclear what LEMAs responsibilities are, with one mayor commenting, "they have something to do with civil defense, I think" (Quarantelli, 1985, p. 15). In addition to community leaders being unsure what LEMAs were responsible for and often simply overlooking the organizations in crisis situations, Quarantelli (1985) argued that while LEMAs had a legal standing at the time of the study—alluding to the Disaster Relief Act of 1974—many LEMAs suffered from a perceived lack of legitimacy in the eyes of the public, and that "legitimacy of course is not legality; LEMAs all have the latter, they generally lack the former" (Quarantelli, 1985, p. 16). And as Fischer's (1998) survey of Ohio LEMA directors revealed, emergency management professionals, including directors, once adhered to common myths about disasters long after better information was available, such as the myths that "initial damage estimates" and "initial death and injury estimates" are accurate (p. 104).

The legitimacy of LEMAs has increased tremendously since that study, particularly with changes that began in the 1990s and the rise of terrorism awareness in the 2000s (Emergency Management Institute & FEMA, 2004). In addition, with the Post-Katrina Emergency Management Reform Act of 2006, the federal government has mandated closer cooperation between emergency management agencies at the federal,

state, and local levels (DHS, 2010), a change that addresses problems Quantarelli noted in the lack of hierarchical connections. While LEMA legitimacy has improved since the 1980s, it is important that these agencies work to promote their legitimacy and credibility, particular given their importance as a source for public disaster information.

Local emergency management plays a distinct communication role in a given community. Demuth, Morss, Morrow, and Lazo (2012) examined LEMA manager goals as part of a study of three common sources for information about hurricane events: professional weather forecasters, emergency managers, and local radio and television personnel. They argue that while the three groups share two overarching goals—to "save lives" and to "reduce injury, property loss, economic disruption, and overall harm"—the groups serve different communication functions (p. 1133). Local emergency managers saw their primary function to be protecting the public by "informing people at risk and helping them keep out of harm's way" (p. 1133). These efforts focus on "recommending, coordinating, and implementing preparedness and public safety activities" and letting the public know what actions they need to take—disaster preparedness, evacuations, etc. (p. 136). These functions include communicating with various populations; in some cases, emergency preparedness professionals and volunteers receive special training, such as training to work with the deaf and hard of hearing (Engelman et al., 2013).

Demuth et al. (2012) note that the emergency managers also play a critical role in translating weather information for decision makers, such as elected officials. Local media also turn to emergency managers to help synthesize weather information, and at least one of the media professionals interviewed called for emergency managers to create an advisory bulletin, preferably emailed, that summarizes what the public needs to do to react to a crisis, noting that the information is "getting buried in press conferences" and that information on the EMA website is not always up to date.

2.1. EMAs and online communication

Kapucu, Berman, and Wang (2008) argue that websites are a key element for disseminating emergency information. But providing information is not enough: sites must be usable, be accessible, promote transparency of operations, foster trust, and promote interaction (Sagheb-Tehrani, 2010; Scott, 2005). An early study of SEMA websites (Hwang, Sanderson, & Lindell, 2001) revealed that many SEMAs provided little information on hazards and that three SEMAs did not have publicly accessible websites. Liu (2008) shifted from a hazards focus to a more general analysis of SEMA websites and examined what options citizens had for contact and interaction with their SEMA, how SEMAs communicated with special needs populations, what external sites were linked to, what types of disaster information were present, and what public relations information was present. Drawing on Liu (2008), Reddick (2010) revisited the SEMA websites and found, in part, that the number of declared disasters did not necessarily predict the presence or absence of SEMA website features. LEMA websites have received modest research coverage. Schmalzried, Fallon, Keller, and McHugh (2011) offered the broadest examination of LEMA websites, evaluating all available U.S. county-level LEMA websites using a dichotomous evaluation (based on presence or absence) of nine elements drawn from Kim et al.'s (1999) recommendations for health-related websites. Schmalzried et al. (2011) described the nine elements as a minimum standard and argued that these elements are "essential for effective communications during emergency or disaster situations" (p. 1):

1. State where Local EMA is located
2. Local EMA phone number
3. Logo
4. Name of the top Local EMA official
5. Link(s) to other agencies with emergency preparedness information
6. Local EMA e-mail address

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