ABSTRACT

Crowdsourcing Rescue: Empowered civilian natural disaster response
in the social media age

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When official first response systems are overwhelmed in the wake of natural disaster, civilians often take it upon themselves to do whatever they can to help those in need of rescue. This spontaneous volunteer response is not new to the world of natural disaster, but it is growing in new ways. In this thesis, I explore how certain technologies in the age of social media assist and empower civilians to respond to natural disasters in meaningful and effective ways. In this paper, I take a close look at the story of a technology created in the wake of Hurricane Harvey in Houston and how it was able to assist voluntary first responders in saving thousands of lives. The technologies and methods that have sprung from the spread of social media hold significant relevance for how we may address the subject of disaster rescue in the future.

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CROWDSOURCING RESCUE: EMPOWERED CIVILIAN NATURAL DISASTER

RESPONSE IN THE SOCIAL MEDIA AGE

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THE STORY

The Storm and the Civilians

Matthew Marchetti took a deep breath after a long Sunday of unfamiliar and difficult work. Usually he would not be doing this much work on a Sunday, but the circumstances certainly called for it. It's not every day that a giant storm hits the fourth largest city in America.

Hurricane Harvey made landfall on the Texas coast August 25, 2017. Two days later, the storm's center moved over the greater Houston metropolitan area. Though it had been downgraded to a tropical storm by the time it reached Houston, Harvey's rainfall impact was significant. Harvey would eventually become the wettest tropical cyclone on record in the United States, with precipitation levels above 60 inches in certain parts of Southeast Texas.

Marchetti, a 29-year-old Houston native with a day job in real estate, wanted to do what he could to help those in danger from the rising flood levels. He spent Harvey's first day in Houston riding around on a boat doing his best to assist people.

"I didn't do much, it was like five or six rescues," Marchetti said (M. Marchetti, personal communication, January 23, 2019). "And rescue is a kind of strong word, too. It was basically like transporting them from their house."

Marchetti's first day of "transports" included mostly members of his church, Chapelwood UMC in Houston. As night fell on the 27th, the rain continued and the church's running list of people needing rescue increased. He posted on Facebook, asking anyone who had a boat to contact him and start rescuing people stranded in their

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houses, and then met up with some Chapelwood members at the house of Rev. John Stephens to discuss plans for the next day.

As midnight approached, Marchetti still had work to do. He left the meeting at Stephens' house and went to the leaky office of Connected Realty, the real estate firm he worked for. Meeting up with his friend and colleague Nate Larson, the two began writing code for a website to help with rescue efforts, allowing people in need of rescue and people who could rescue others to input their information on an online database.

The original intent for the website was to organize rescue efforts for Chapelwood members, a small fraction of the church's population of around 6000 members. The two developers gave the site the snappy name "Houston Harvey Rescue," and shared the site's link on their personal Facebook pages around 4 a.m. on August 28.

A week later, nearly 30,000 people had been rescued through the site's database.

The Seeds of Spontaneous Response

"We kind of have a chip on our shoulder," Marchetti said. "After every disaster there's a lot of spontaneous volunteers and nobody ever really wants to coordinate it, but as an organization we do just that. We coordinate spontaneous volunteers and we go out in the middle of a disaster and rescue people."

Marchetti and Larson are now two years into their Harvey-born nonprofit that has since been renamed CrowdSource Rescue (CSR). Marchetti describes the primary mission of CrowdSource Rescue to be "empowering spontaneous volunteers in a disaster situation."

The idea of civilians stepping in to rescue people in disaster situations is not a new concept. It is nearly a universal aspect of the human instinct to help others in need when possible.

The Halifax Harbor explosion of 1917 is a prime example of this principle in action. After an explosion caused the death of nearly 2000 people in Halifax, Nova Scotia, and its surrounding area, civilians that had survived the fatal blast sprang into action. (Adams, 2017)

Sharon Adams of *Legion Magazine* wrote in an article on the Halifax explosion in 2017 that "the stunned populace, soldiers in garrison and sailors on ships, many of whom initially thought the Germans had attacked, reacted quickly to the crisis. The unharmed and the walking wounded flocked to Richmond to help the injured, dig out those trapped in ruins, and stop the fires from spreading," (Adams, 2017).

In James F.E. White's *The Garrison Response*, a soldier remarks that his colleagues spontaneously sprang into action with "utter disregard for their own safety, immediately pulling people out of the ruins of their homes." While this was a group of soldiers, he notes that not one of them needed a command "to go to the rescue of their fellow human beings in that hour of dire disaster," (White, 2014).

The "Little Ships of Dunkirk" brigade that mobilized as a part of Operation Dynamo in World War II is another example of civilian rescue response. When the British government requested the usage of civilian boats to travel across the English Channel and rescue stranded troops at Dunkirk, many civilians stepped up and volunteered to sail the boat themselves, including Charles Herbert Lightroller who

insisted once his boat was requested that "if anyone was to take (the ship) it would be him" (Day, 1940).

The spirit exhibited by the Halifax responders and the Dunkirk volunteers lives on today in natural disaster response volunteers. Individuals still feel called to help others who are in desperate need of rescue. While the intent of the players in spontaneous rescue has remained roughly the same, technological advances have meant that the playing field of the 21st century has seen significant changes.

Neighbors Helping Neighbors: "You just do it"

Rev. John Stephens was an active player in Harvey's rescue response field, though he would never consider himself in the same category as a Dunkirk or Halifax responder.

"When I heard that [people needed rescue] my first thought was 'Well, there's not anything I can do about that. Call 9-1-1,'" Stephens said (J. Stephens, personal communication, January 10, 2019). "I didn't really want to do it, but you get into these situations in life where you realize you're the only one that can do something in that particular moment, and you just do it."

After the impromptu house meeting on Sunday night, Stephens posted on his Facebook page asking for people with access to boats to respond. A couple takers responded and met up at Stephens' house the following morning to begin rescuing others.

"One little rescue one mile down the road with an inflatable dinghy turned into 'Hey, we can do this,'" Stephens said. "All of a sudden we've got other guys with other boats, (and) we can help a lot of people. Once people saw there was a need, there was an innate desire to respond."

As Stephens and his makeshift armada embarked on their first missions that morning, Marchetti and Larson awoke after a brief night of sleep in their company's office. They checked the Houston Harvey Website and found that in the five-hour period they were asleep, more than 1500 people had signed up in need of rescue.

"Monday was a really hard day," Marchetti said. "What are we gonna do? We have two boats. 9-1-1 was starting to go down, and we were spiking."

According to Marchetti, the number of people needing rescue grew from 1500 to 7000 by that afternoon. Luckily, as this number rose, so did the amount of help they received. Marchetti logged on to Zello, "a walkie talkie app on your phone," and found that progress was being made in Houston Harvey Rescue's cases.

"They were saying stuff like 'Case 314 just got rescued' or 'I just sent rescuers over to case 712,' and then I started realizing -- those are our ID numbers! We didn't tell anybody to do that, but people just logged onto the site and helped organize in their own neighborhoods and that number started dropping."

As the storm carried on, more and more rescuers signed up to help through Marchetti's application. Volunteers stepped up to handle responding to the individuals who reported each case, as well as the rescuers who signed up to answer the call. Additional help arrived once the volunteer organization Cajun Navy mobilized its boats to help out in the greater Houston area.

Holly Hartman, a journalism teacher at Memorial High School in Houston, volunteered as a dispatcher on the Zello channel for the Cajun Navy. She detailed her story in a Facebook post, including the graphic stories that she experienced firsthand as a

volunteer. Though she still related the great losses that had been felt around the community, she acknowledged how things also could have been much worse.

"How many more people would be dead today if not for our first responders and the thousands of volunteers here? What if a flood of this magnitude had happened 20 years ago, before cell phones and social media? The deaths would be in the hundreds," Hartman said (Hartman, 2017).

Hartman made a relevant point, particularly with the advent of social media and advanced communication technologies: social media can and has played a significant role in revolutionizing the world of disaster response. Social media is becoming the norm for disaster communication; in fact, a number of studies have examined different ways social media is being used by disaster responders.

Social Media: Disaster Response's New Frontier

A study titled "Social media and disasters: a functional framework for social media use in disaster planning, response, and research" was completed in 2014 by a group of scholars, including J. Brian Houston of the University of Missouri's Terrorism and Disaster Center. This study analyzed an extensive literature review over social media in disaster communication scenarios to develop a framework of disaster social media.

The disaster social media framework included fifteen key functions of disaster social media, ranging from the timespan of pre-, during and post-disaster. The area of civilian response is furthered by two of these key functions: to "send and receive requests for help or assistance" and to "inform others about one's own condition and location and learn about a disaster-affected individual's condition and location," (Houston et. al, 2014). These functions take place primarily during disaster response and are often

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initiated by those seeking rescue or access to resources as a point of survival in post-disaster conditions.

Sending and receiving information regarding rescue is paramount to the field of spontaneous civilian and official government rescue response. Social media spaces and extended communication technologies like CrowdSource Rescue assist those in need of rescue with access to social media in reaching a larger audience of potential rescuers, and thereby increasing their chances of survival. In return, rescuers have a larger pool to draw from in identifying where they should focus rescue efforts.

Updates about the condition and location of disaster-affected individuals are another key advantage that social media bring to the field of spontaneous civilian rescue response. Geo-targeting and mapping are integral to how CrowdSource Rescue functions, and both have numerous implications for the world of disaster response.

This is not to say that social media technologies do not have weaknesses when it comes to their mobilization in disaster response. In the wake of Harvey, numerous government organizations released statements that those in need of rescue should be sharing their information with their local response agencies rather than on social media. In addition, the overload of communication options can sometimes lead to failures in communication. This was seen in the beginning of CrowdSource Rescue's interactions in Harvey, as the cases reported were not always updated fully. Some cases were left open after the individual had already been rescued, while others fell through the cracks entirely.

The 2014 study suggested that "while significant work is needed to integrate fully these emerging social media into complex disaster systems, the possible benefit to

individuals and society justifies the investment" (Houston et al., 2014). Social media can bring about positive outcomes like access to information, resources and long-term coping, and is an emerging field that will develop greater and more pervasive methods of natural disaster response.

Refining the CrowdSource Phenomenon

After their operations in Harvey, Marchetti and his crew took some time to reflect on what had been the craziest weeks of their lives. Their time of reflection would not last long, however, as more storms began to brew on the horizon.

"A week later, the news about Irma starts coming up and it's the biggest, baddest storm anyone had ever seen," Marchetti said. "It was breaking all these land speed records. Three days out we've got a couple thousand people signed up on the site and we realize, 'OK, we're about to start this process all over again.'"

"We didn't tell anybody to do that, people just started signing up. So we changed the name of the website to Florida Irma Rescue, you know, instead of Houston Harvey Rescue because we realized, 'OK I guess it's Round 2.'"

Within their first two months of existence, CrowdSource Rescue's technology had been mobilized in response to four different natural disasters: Hurricanes Harvey, Irma and Maria, as well as an earthquake in Mexico City.

"It started to click that this might not be a one-time thing. There's a real gap here, all these volunteers are heading into areas, they want to help. 9-1-1 goes down and there needs to be a backup plan."

As a result, the CrowdSource Rescue team began pursuing how they could expand their platform's effectiveness. While they have found opportunities for growth, it has not been praised by everyone.

"As Matthew's spreading this thing out to new areas, he's running into a lot of blowback from public safety or the government," Stephens said. "They like the idea, but they don't want ordinary people out there saving folks."

This criticism does hold some reason. When "ordinary people" choose directly to go into the line of danger to rescue others, risks increase for the situation, and additional rescues from already over-committed "official" first responders could be required.

While the reason for minimizing risk stands in principle, the principle can often be outweighed by the reality of the situation. In a situation like Harvey, many more lives would have been lost without the assistance of civilian rescuers. This is supported by the fact that Harris County itself encouraged civilian contribution as Harvey's floodwaters rose.

"I asked for volunteers to come forward with boats and high-water vehicles," Harris County Judge Ed Emmett said in an interview with CBS News in August 2017. "There are a lot of people who just did it on their own" (CBS News, 2017).

To those who critique his organization on the grounds that civilians should not be risking their lives in disaster, Marchetti simply cites the fact that spontaneous volunteering "has always been a thing" and likely will always be a thing. In disaster scenarios, there can be a limit to what government organizations can do. Marchetti believes that organizations like his can provide additional support in the organization and deployment of additional resources that other agencies lack.

"People will start going off on their own and seeking outside sources of help," he said. "And that would happen without CSR. This is a naturally occurring phenomenon. What we're doing is enhancing that and making the naturally occurring phenomenon way more organized, way more focused and reliable."

A Cause Worth Fighting For

Back to the chip on Marchetti's shoulder. His Houston Harvey Rescue system was a remarkable success: connecting and rescuing more than 30,000 people with no deaths reported among those who requested help. And yet, he always knows there is more that can be done.

Hung on the wall of CrowdSource Rescue's current office are five large printouts of a map and a picture of a person. The printouts bear the name and residence of five people who died in Hurricane Harvey. These five individuals did not register through the Houston Harvey System, but were found dead within a block of a neighbor who was saved through the system.

"That is nothing short of unacceptable," Marchetti said. "Their stories haunt me, they motivate me. That we could have prevented their deaths but didn't because we didn't know they needed help is nothing short of an abject failure in the overall system."

Invigorated by how his organization has grown so much in such a short amount of time, Marchetti is passionate about seeing his mission of empowering spontaneous volunteers through to its fruition. CrowdSource Rescue continues to grow and diversify, responding to natural disasters as they occur, as well as addressing new crises, including a new initiative that mobilizes volunteers to aid opioid overdose patients. A common thread through all of this is the value of integrating with government response: Marchetti

has collaborated with 9-1-1 and emergency agencies on many of his new initiatives. Currently, he is petitioning at the Texas State Capitol for a house bill that strengthens the framework for emergency management agencies to work with volunteer organizations like CrowdSource Rescue.

At the end of the day, Marchetti still remains inspired by neighbors helping neighbors, which has been the heart of his operation since its onset. In preparing for his discussions at the Capitol, Marchetti shared the following musings on his Facebook wall:

Consider this - if a someone stumbled and fell to the ground in front of you at the grocery store, what would you do?

Would you first consider the liability implications of helping them, undergo a background check, get drug tested, and seek permission from the government or an established organization before helping?

Or rather would you extend a hand immediately and help them up?

I don't think we can quite call you a "volunteer" once you help them up. I think you'd just be ...a human, operating in your natural instinct to help others.

It is something deep in our soul, that spontaneously and immediately says "of course I'll help".

Disasters are complex beasts. There are certainly operational and training details in the mix. But at a deeper level, there exists the soul of a humanity that I find good; one that would jump in a boat, run a chainsaw crew, dispatch at their kitchen table.

Because of course they will. It's part of our collective DNA.

That gives me nothing but hope.

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