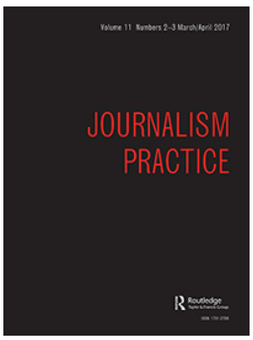

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DIGITAL HUMANITARIANS
Citizen journalists on the virtual front line of natural and human-caused disasters

Wendy Norris

Eyewitness user-generated content has dominated the study of citizen journalism in crisis and conflict zones. However, the convergence of online networked technologies, like social media, collaborative mapping and real-time information management, gives ordinary people the capacity to commit acts of journalism from afar. Networks of virtual volunteers act as digital humanitarians who rapidly assemble situational awareness at the onset of natural and human-caused disasters through crowdsourcing, data analysis and crisis mapping to aid on-the-ground emergency response. While they have been studied through the multi-disciplinary lens of information science, computation, geography and emergency management, digital humanitarians have received little attention in the journalism literature. This exploratory study contends that the knowledge-based content produced by these groups is citizen journalism akin to data-driven investigative news. Two case studies and a cross-case analysis consider this argument through digital humanitarian work of the Standby Task Force on the 2015 European refugee crisis and the 2016 earthquake in Ecuador. These and other emerging crisis/conflict zone examples suggest a broader perspective is needed on citizen journalism not bounded by eyewitness user-generated content. Future research directions to explore digital humanitarianism as a form of citizen journalism are also offered.

KEYWORDS citizen journalism; crisis reporting; crowdsourcing; digital humanitarianism; humanitarian crisis; journalism studies; Standby Task Force

Introduction

Citizen journalism is still too often viewed in binary terms: user-generated, eyewitness accounts that augment professional reporting or amateurish, free-wheeling records of hyper-local events. With few exceptions, these industry blinders have slowed the advancement of new journalism practices (Paulussen et al. 2007) and, in turn, have limited opportunities to study and learn from the field.

News innovation by non-professional journalists exists. But it increasingly requires media scholars to look beyond the usual suspects of newsroom pioneers for examples. This study explores one particular community of interest: digital humanitarians.

These self-organized, online networks of information technology volunteers use human- and machine-computing methods to rapidly collect, verify and analyze data at the onset of natural- and human-caused disasters. While relatively unacknowledged in the journalism studies literature, digital humanitarianism has attracted an extensive body of theoretical and applied research in other disciplines, such as information science (Palen 2013; Starbird and Palen 2013), computer science (Dailey and Starbird 2014;

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Ludwig, Reuter, and Pipek 2015; McClure and Gray 2015), emergency management (Hughes and Tapia 2015; Ley et al. 2014) and geography (Burns 2015a; Ziemke 2012).

This paper will present two specific but divergent cases of citizen journalism by one of the leading digital humanitarian groups, the Standby Task Force (SBTF). In the first case, the group collaborated with Internews to investigate the information needs of war refugees flowing into southern Europe in 2015 as co-created journalism. The second case describes a pilot effort by SBTF to self-publish journalism in the aftermath of a 7.8 magnitude earthquake that struck rural Ecuador in 2016.

These cases contribute to the literature in several ways. First, the phenomenon of digital humanitarianism explores the tenets of citizen journalism from outside the usual media-centric perspectives of the field (Reese 2016) which lends itself to broader thinking about practice and critical reflection. Digital humanitarianism has not been described as citizen journalism in the literature, though it employs familiar news-gathering practices, such as data collection, verification and analysis. Second, other research disciplines that study online collaborative work, like digital humanitarianism, offer valuable ideas and pathways for media scholars to discover other, uncharted examples of citizen journalism (Watson 2013). The standards and practices of data collection, verification and sense-making in information management have analogs in journalism routines that offer interesting opportunities to expand the concept of crowdsourced citizen journalism as interpretive, evidence-driven and knowledge-search methods (Aitamurto 2015).

The practical news value of digital humanitarian work is also demonstrated by a media outlet winning a Pulitzer Prize for breaking news stories that resulted from an SBTF collaboration in the aftermath of a natural disaster.

This exploratory study provides background on digital humanitarianism, its significance and its intersections with crowdsourcing, citizen journalism and crisis news reporting. A brief description of the methodology prefaces two case studies of citizen journalism within the context of digital humanitarianism. The study concludes with a cross-case analysis and summary of potential future research directions.

Digital Humanitarianism

Digital humanitarian work can be tricky to conceptualize since it is decentralized, self-organized, volunteer-based and virtual (Phillips 2015). It is not tangible in the traditional sense of collaborative working groups and it is also a relatively new inter-disciplinary field which integrates social computing and technology, information systems, networked collaborative organizational structures, communication and emergency management. There is no one discipline, theoretical home or practice upon which to lay down a marker which also complicates its definition.

Today, there are 31 Digital Humanitarian Network member organizations that are typically comprised of citizen volunteers (Digital Humanitarian Network, n.d.). These groups coalesce into four primary categories of volunteers and technical communities (Global Solutions Network 2014) (Table 1).

This study is focused on the crowdsourcing groups that collect, verify and analyze online information to provide situational awareness to emergency responders in the early moments of a natural- or human-caused disaster. The artifacts produced typically include a comprehensive "Who, What, Where" ("3W") list of responding agencies, resources

TABLE 1
Digital Humanitarian Network members and service categories

Services	Members
Crowdsourcing	Standby Task Force
	Humanitarian OpenStreetMap Team
	Humanity Road
	Info4Disasters
Expert communities	CartONG
	CrisisCommons
	CrisisMappers
	DataKind
	Geeks Without Bounds
	ICT4Peace
	MapAction
	NetHope
	Pacific Disaster Center
	Relief 2.0
Volunteer recruitment	Help Earth Foundation
	PeaceGeeks
	Statistics Without Borders
	TechChange
	Translators Without Borders
	UN Online Volunteers
	URISA GISCorps
Technical infrastructure	Connected Development
	Digital Globe
	Disaster Tech Lab
	Esri
	GeoThings
	GNUcoop
	Google Crisis Response
	Sahana Software Foundation
	Ushahidi
	WorldPop

and contact information, analysis of user-generated social media content, as well as data visualizations and detailed maps of the crisis zone.

Digital humanitarianism burst onto the scene during the catastrophic January 2010 earthquake in Haiti where 140,000 people perished and 1.2 million were left homeless. An official with the International Federation of the Red Cross called Haiti a game-changer for relief groups:

> Out of the urban devastation in Port-au-Prince came a torrent of SMS texts—people crying out for help, besetting us for assistance, sharing data, offering support, looking for their loved ones. This was a situation that traditional aid agencies had never encountered. We were in one of the poorest countries on the planet, but 80 percent of the people had mobile devices in their hands. We were unprepared for this. They were shaping the aid effort. (Conneally 2015, 61)

While there are a few instances of digital humanitarian work dating back to 2001 led by information management professionals at crisis response agencies, the Haiti earthquake changed the scope, scale and purpose of eyewitness user-generated content coming out

of disaster zones. The pervasive use of camera-enabled mobile phones and perpetual connection to social media have unleashed a torrent of metadata during crises that document geographic location, timestamps, provenance of digital artifacts like photos and video, and other crucial bits of evidence important to timely, effective emergency response (Ludwig, Reuter, and Pipek 2013).

Online collaboration tools and protocols, like document sharing, open-source mapping software and social media hashtags, now give ordinary people the capacity to form virtual networks to lend help during distant emergencies (Collins 2013; Palen 2013; Starbird and Palen 2013). Digital humanitarianism is perceived as a potential solution to the technical and communication barriers faced by emergency managers (Hughes and Tapia 2015).

But for all the high-tech capacity, much of the work remains grounded in human intuition, curation and judgement. It is important to reiterate that digital humanitarians are not direct witnesses—they collect, verify and package eyewitness accounts shared through SMS text messaging, social media and other public sources. The "curated bystander experience" is then distributed in a more readable and actionable format akin to a remote wire service. The information gathering and verification processes used by digital humanitarians very much mirror newsroom routines of monitoring social media and incorporating eyewitnesses into news stories.

Another trait digital humanitarians share with journalists is an appreciation for the inherent value of information. Various international media development organizations have backed "Information is Humanitarian Aid" initiatives to draw attention to the need for print and broadcast news organizations to provide practical relief information for crisis-affected publics (Hieber 2001). But the campaigns have met with mixed results (Chapelier and Shah 2013). The rise of news reporting produced by non-governmental organizations (Waisbord 2011; Wright 2015) and citizen journalism by digital humanitarian groups appears to be a reaction to these unfulfilled information needs.

Digital humanitarian work, however, is not without its detractors. Interdisciplinary research in critical and feminist geographic information science, social science, and law and ethics have recently raised important concerns about the collection, processing and use of humanitarian crisis informatics, particularly those derived from "big data." These massive datasets of unstructured social media can easily swell into millions of data points that require sophisticated processing and careful social interpretation. An overreliance on the technical hype surrounding big data over a more holistic human-centered approach can create harmful, unintended consequences for crisis-affected people and the crisis management sector. Concerns about power dynamics, social inequalities, privacy and consent, and knowledge privileged by access to technology (Burns 2015b; Crawford and Finn 2015; Madianou 2015; Martin-Shields 2013) demand attention by digital humanitarian practitioners and academics. In particular, the collision between arms-length sense making (big data) and cultural knowledge (local expertise) reifies social problems around power and agency (Read, Taithe, and MacGinty 2016) that can lead to ineffective, if not dangerous, responses to crisis/conflict zones.

The societal consequences of big data are also salient to journalism. The challenges of gathering, interpreting and framing highly fluid information during a crisis event are well-established. The capacity to use big data to report disasters in near real-time through data-driven journalism is becoming more viable as computational tools improve. Though serious concerns about the benefits and limits of big data on journalism abound. As Lewis and

Westlund (2015) identified, the effects of big data on the epistemology, expertise, economics and ethics of news production echo many of those addressed above. Further study of the critical intersection between journalism and digital humanitarianism could help to unpack and potentially resolve some of these well-founded concerns.

Crowdsourcing and News Reporting

Another natural inflection point between digital humanitarianism and journalism is in the use of crowdsourcing. The portmanteau, coined by Howe (2006), describes the process of distributed group-work, or outsourcing incremental tasks to a large crowd of people in an open-call format to accomplish a larger activity (Brabham 2013).

In both digital humanitarian work and news production, crowdsourcing is a two-pronged process of information assemblage and information authentication.

Sometimes referred to as "open journalism "or "co-created journalism," news crowdsourcing employs a similar knowledge-search method that is guided by public participation and transparency between the reporter and volunteers (Aitamurto 2015). However, the definitional boundaries between open journalism, led by a newsroom, and citizen journalism blur when both activities involve collaborative group work. For the purposes of this study, it is important to distinguish between one-directional crowdsourcing as an open-call for user-generated content by a news organization versus a collaborative, bi-directional and methodical data-gathering process that co-creates collective knowledge that is used in content. It is the latter definition that is more applicable to digital humanitarianism and how it conducts newsgathering in partnership with a news organization or independently as self-published citizen journalism.

Citizen Journalism and Crisis News Reporting

Despite the extensive literature on citizen journalism, an agreed definition is surprisingly hard to come by. This study adopts the description by Wall (2015) as text, broadcast or interactive news content produced by non-professionals.

In the context of natural disasters and human-caused crises, the notion of citizen journalism is often confined to instances of user-generated content posted by eyewitnesses on social media (Allan 2013; Allan and Peters 2015; Thorsen and Allan 2014).

New forms of citizen journalism that play a stronger, more participatory role in news reporting are beginning to emerge, particularly from conflict zones where it is too dangerous for professional reporters to travel. Through the use of collaborative technologies and processes, like crowdsourcing, private citizens, activists and witnesses now act as interpreters of user-generated content for news outlets (Sienkiewicz 2014), as news producers (Wall and Zahed 2015) and as trusted information brokers (Andén-Papadopoulos and Pantti 2013b). However, even these examples still tend to engender traditional gatekeeping and agenda-setting by newsrooms that positions citizen journalists as adjunct to professionals.

As Watson (2011) notes, there have been few studies of individuals committing independent acts of journalism during catastrophes. A notable example is the clandestine reporting and documentary filmmaking by citizens in Myanmar in the aftermath of Cyclone Nargis, that caused an estimated 140,000 deaths in 2008 (Downman 2013). Wildfires, mudslides and other extreme weather events in rural southern California were

reported on local community websites (Novak and Vidoloff 2011) and other communication backchannels (Shklovski, Palen, and Sutton 2008; Sutton, Palen, and Shklovski 2005) when the information needs of the residents were unmet by professional media. However, the California examples were published in the emergency management and computer science literature, further exacerbating the research gap in journalism studies.

Inter-disciplinary research has examined citizen journalism as an act bearing witness from the perspective of journalistic norms and routines (Andén-Papadopoulos and Pantti 2013a; Thorsen and Allan 2009; Waisbord 2013a); as a technical problem to address quality and trustworthiness (Ludwig, Reuter, and Pipek 2015); and as an examination of mass communication (Vultee and Vultee 2011).

The high ideal of accuracy, as a mark of information quality and reporter professionalism, reveals a serious friction point between journalism and other disciplines studying digital humanitarianism. Studying socially shared user-generated content from the point of view of crisis informatics, Palen, Vieweg, and Anderson (2010) contend people seek out information that is helpful, timely and credible to guide personal decision-making during emergencies. Another study evokes a "good enough" standard for crisis-related user-generated content for responders to rely on (Tapia and Moore 2014).

As Palen, Vieweg, and Anderson (2010, 53) argue, "[an] unrealistic attachment to the ideal of accuracy" inhibits development and refinement of innovative practices which could better satisfy the information needs of crisis-affected people. An expanded notion of citizen journalism to include other types of civilians who can contribute to news production in meaningful ways, aside from providing eyewitness accounts, guides the forthcoming case studies.

Methodology

The aim of this exploratory study is to establish a foundational research question:

RQ1: In what ways is digital humanitarian work an example of citizen journalism?

While there is ample research on digital humanitarianism from other disciplines, a media perspective has been all but neglected on whether this collaborative work produces independent news content or upholds important journalistic values, like multiple sourcing, verification and advancing knowledge.

A qualitative case study design, favored by Creswell (2003) and Yin (2014) coupled with a participant-observer approach (Kawulich 2005), was used to inform the study. The investigator is a member of SBTF but did not actively participate as a volunteer in either of the examined cases. SBTF leadership was informed of the research in advance and the investigator agreed to anonymize volunteer identities in the event documents revealing personal communications were disclosed.

Fifty-seven textual artifacts were reviewed, including: raw and analyzed "3W" crowdsourced data, SBTF project-related blog posts and after-action reports, SBTF volunteer training materials (data verification, information management and media monitoring), Internews publications, verbatim transcripts from Slack, a real-time synchronous communication platform used for SBTF project coordination, and two citizen journalism projects published on Storify.com and Silk.co.

The documents were assessed through a thematic analysis to identify typical journalistic processes, newsroom routines and industry ethical standards embedded in the

reviewed documents. The content was analyzed through an inductive approach at the semantic level.

This exploratory study forms an initial establishing argument for future research on technically mediated citizen journalism. A follow-up study, currently in progress, incorporates a mixed-methods content analysis of published news articles about the European refugee crisis grounded in field theory. A future phase of this inquiry will analyze additional primary data, including semi-structured interviews of SBTF volunteers and journalists involved in news projects.

Description of the Standby Task Force

SBTF was established as an informal volunteer network in 2010 following the Haiti earthquake. The group incorporated in 2014 as a tax-exempt US nonprofit organization and adheres to a code of conduct. As one of the more established and structured groups, SBTF maintains formal relationships with leading global relief organizations, such as the United Nations Office for the Coordination of Humanitarian Affairs (OCHA), the World Health Organization and international non-governmental organizations. Previous news organization collaborators include ABC Australia, Al Jazeera, Internews and the *Tuscaloosa (AL) News*.

SBTF uses a formal activation request system (Standby Task Force, n.d.) which outlines its mission-compliant criteria: humanitarian emergency declared under the International Charter on Space and Major Disasters; clear and pressing need for crisis mapping and/or situational awareness; detailed plan for data collection, sharing and privacy controls; demonstration of security risk analysis for local population and SBTF volunteers. The group does not communicate with crisis-affected communities and will not deploy in non-permissive environments, e.g., insecure conflict zones or without approval of a local authority. Most activations last 14 days or less.

The SBTF roster consists of 1800 volunteers from 100 countries worldwide. Membership includes experts (professional emergency management and humanitarian practitioners), academics and citizens. All of its crowdsourcing and organizational management activities are conducted online through the use of collaborative groupwork platforms, including Google products (Drive, Docs, Sheets), blogging software (Ning, WordPress) and synchronous communication tools (Slack, Skype).

SBTF offers a comprehensive online training program to all volunteers on data verification standards, media monitoring practices and ethical information management. Training materials are derived from the *Verification Handbook* (European Journalism Centre 2014) and "Incorporating Big Data into Humanitarian Operations" (United Nations Office for the Coordination of Humanitarian Affairs 2015) among other resources. Most, if not all, of the protocols used by SBTF volunteers for sourcing, verification, data triangulation, etc., closely resemble journalistic routines and practices.

The SBTF cases that follow represent two different expressions of citizen journalism: (1) co-created crowdsourced journalism with a news partner and (2) independently produced data-driven journalism. The cases were specifically selected to illustrate the broad range of citizen journalism from user-generated content during crisis to a more sophisticated example centered on data storytelling that incorporates professional news logic, e.g., competence, expertise and ethics (Waisbord 2013b).

Case Studies

Case 1: Internews refugee information flow project. The humanitarian refugee crisis on the European continent began slowly in 2014 and surged exponentially in 2015. The confluence of regime-toppling invasions, brutal civil wars, terrorism targeting civilians, human rights abuses and economic hardships in the Middle East, Central Asia and Africa drove nearly 1.3 million people to flee their home countries and officially apply for asylum in Europe (Eurostat 2016). Officials estimate upwards of another one million more displaced people currently live in Europe and are not formally registered. Fifty-three percent of the known asylum-seekers are from Syria, Iraq and Afghanistan.

Internews, a global media organization, approached SBTF in September 2015 to request crowdsourcing assistance to determine how refugees in southeastern Europe obtained information about humanitarian services. From its news outposts in the Balkans, Internews discovered that refugees arriving from Turkey lacked essential information about shelter, medical care, transportation and border closings. What little information was distributed was in English, not Arabic, Pashto, Dari or other native languages of the refugees.

> Shockingly, despite intensive media coverage of the situation there throughout the late summer, and the presence of hundreds of volunteers and aid agency personnel, there was not even the most basic signage or other information to greet people as they land and help them understand where they were and what to do next. (Campbell 2015)

The one-week data collection and analysis project was conducted from September 16 to 23, 2015 with 97 SBTF volunteers. The crowdsourcing project (see Table 2) involved searching websites, news reports and social media accounts and logging "3W" information to identify "who" is providing "what" humanitarian services and "where" in six European countries (Greece, Croatia, Hungary, Macedonia, Serbia and Slovenia) which were the then-favored routes of refugees making their way north to Germany. The data was derived from official communications, news stories, and user-generated content from refugees and relief volunteers.

Per SBTF protocol, volunteers used real-time, collaborative Google information management products to enter data via a form that auto-populated a spreadsheet. The spreadsheet was used to coordinate verification of the "3W" data. SBTF logged a total of 168 formal relief organizations and informal *ad hoc* local volunteer groups that were operating in the six target countries. Collected data was triangulated across date/timestamps, multiple sources, provenance and/or metadata to establish authenticity.

The Internews case represents the typical scenario for an SBTF news collaboration—information is collected, verified and analyzed through crowdsourcing. It is then turned over to the news partner who produces the co-created journalism from SBTF's data.

A thematic analysis of Internews' online publications, including news stories, wikis, blog posts and social media about the refugee crisis dated after September 30, 2015, revealed that 100 percent of the SBTF crowdsourced data was incorporated into the content. The dataset was also released to the public (see https://data.humdata.org/dataset/european-mediterranean-refugee-response) on the Humanitarian Data Exchange website (Internews 2015). Shortly after the SBTF collaboration, Internews launched a new project "News That Moves," a mobile-enabled website for refugees. The site curates daily

TABLE 2
Internews–SBTF refugee information flow project timeline

Time frame	Volunteer activity
1. Pre-activation (before September 16, 2015)	SBTF Core Team evaluates and approves Internews project request SBTF alerts volunteers about project via blog post, email newsletter and Slack channel.
2. Activation period (September 16–23, 2015)	SBTF volunteers collect and assemble "3W" (Who, What, Where) data on humanitarian services (food, health, information, legal support, non-food items, shelter and transportation) provided in the six target countries from online sources (social media, news reports, humanitarian situation reports, non-governmental organization websites and local contacts) Recruitment call made for SBTF volunteers who speak Arabic, Pashto and Dari to crowdsource non-English-language sources SBTF volunteers verify initial crowdsourced data via triangulation of date/timestamps, geolocation, source provenance, social network reach and reputation SBTF volunteers correct and append crowdsourced data
3. Post-activation period (after September 30, 2015)	SBTF Project Coordinators assemble crowdsourced data for delivery to Internews SBTF Lead Project Coordinator produces and posts public after-action report on SBTF website

news about the refugee migration by Balkan-based stringers that fact-check information to dispel rumors.

The data collection process for this project was particularly challenging for several reasons that highlight how this form of co-created journalism between a newsroom and citizens varies significantly from other types of citizen journalism. The escalating levels of chaos and strife on the ground made retrieving data from trusted public sources more difficult to come by. Private social media accounts, many in languages other than English, often contained the most up-to-date humanitarian information but it required thorough, multi-step verification.

Two weeks prior to the project launch came news of the drowning death of a three-year-old Syrian boy Alan Kurdi. A photograph of the boy's body washed ashore on a Turkish beach was published worldwide and ignited a firestorm of controversy about the plight of the refugees and the political, economic and social effects of migration on the European Union and its member states. Shortly thereafter, several of the target countries experienced an influx of concerned but inexperienced and under-resourced European citizens banding together in unofficial capacities to provide humanitarian services. The well-intention acts dominated news reports, making the search for legitimate information for and about refugees more difficult. Moreover, the political controversy moved several of the target countries to forcibly close borders, erect razor wire fences at crossings, deploy armed security services at relief centers and shuttle refugees to make-shift camps. According to the chat transcripts, this project was one of the most challenging for SBTF volunteers, resulting in frequent conversations about information sourcing and data verification concerns.

Case 2: Ecuador earthquake self-publication project. On Saturday, April 16, 2016 at 18:58 local time, a severe 7.8 magnitude earthquake struck the northwest coast of Ecuador. More than 650 people perished, 30,000 were injured and 720,000 needed emergency assistance due to damaged or destroyed infrastructure.

The usual protocol for SBTF and other digital humanitarian groups is to initiate data collection upon official request of first responders from international crisis relief organizations or local emergency management. However, when no call for assistance came, SBTF uncharacteristically decided to "self-activate" rather than to return to standby mode.

SBTF mobilized 60 volunteers over seven days from April 18 to 25, 2016, to assemble its typical "3W" report to identify "who" is providing "what" humanitarian services and "where." Volunteers crowdsourced, coded and verified information on 193 responding organizations and curated/authenticated situational awareness data from both official and unofficial channels, including user-generated content. Without a collaborating partner organization, SBTF took another unusual step by self-publishing the crowdsourced data.

Volunteers launched separate initiatives on Storify.com and Silk.co, two online storytelling platforms that are popular with newsrooms for curation and interactive projects.

The Storify board embedded relevant posts from social media streams, images and content links about the earthquake relief effort into a publicly viewable timeline and was updated by the volunteer team several times per day throughout the seven-day project. The curated media assets included important actionable information, such as links to people finder services to report/reunite missing individuals, official government announcements, hospital, shelter, power/water/telephone utility and school information, travel alerts, etc. (see https://storify.com/LizSBTF/ecuador-earthquake). Meanwhile, the Silk team published dynamic, interactive data visualizations, maps and contextualized, geo-located images about infrastructure impacts and casualties (see http://sbtf.silk.co/). The crowdsourced dataset was also made publicly available.

Another unique citizen journalism output from the SBTF team evokes citizen science crowdsourcing projects conducted by civilians and professional scientists. In a similar vein, digital humanitarians collaborate with computer scientists to help analyze large volumes of big data from user-generated content.

In most natural disaster activations, SBTF collaborates with the Qatar Computing Research Institute (QCRI) on Artificial Intelligence for Disaster Response (AIDR), its open-source algorithmic tool. The software collects, filters and classifies large-scale crisis-related user-generated content posted to Twitter (Imran et al. 2014; Meier 2013) in order to derive actionable data. SBTF volunteers "train" the machine logic to improve recognition and classification of contexts expressed in social media text and linked images. Specifically, the volunteers apply qualitative labels (e.g., relevant/not relevant, mild/severe damage rating, infrastructure damage, urgent need, response effort, etc.) to a sample set of tweets through MicroMappers, an external crowdsourcing platform developed by QCRI in collaboration with SBTF and the OCHA. QCRI then combines the machine output with the human intelligence from SBTF crowdsourcing to validate or correct the algorithmic content classifications.

During the Ecuador earthquake activation, 58 volunteers tagged a sample of 889 tweets and 5126 images collected by AIDR. The capacity for citizen journalists to use "big data" computer processing tools for news content development is intriguing and

worthy of critical study of new intersections between the public, newsrooms and technology.

Cross-case Discussion

By design, the two SBTF cases presented here differ in the type of citizen journalism news products that were published.

Revisiting Wall's (2015) definition of citizen journalism as text, broadcast or interactive news content produced by non-professionals, both cases appear to meet the test. The refugee information flow case was a collaborative venture with Internews, in which SBTF delivered substantial data that was used by Internews for reporting purposes. Moreover, Internews and SBTF both published blog posts about the crowdsourced data.

The Internews case also reveals an interesting, new meta-version of citizen journalism that results from curating first-generation original user-generated eyewitness content and local information. By reformulating that user content into aggregated data, maps and visualizations into second-generation user content, SBTF offers a new form of citizen-news collaboration. Further, in thinking about this work as a hybrid peer-to-peer collaboration, the possibility exists for a more thoughtful and fine-tuned first generation–second generation information curation process. With crowdsourcing and data analysis protocols more attuned to the information needs of crisis-affected people, it may merit exploration of innovative ways to confront some of the power, privilege and ethical risks associated with online big data in humanitarian work and in journalism.

The Ecuador earthquake case provides an even more clear-cut example of a citizen journalism project in that SBTF compiled the data and then self-published the work independently on public storytelling platforms.

Radical as it may seem, the simple act of collective news-gathering should also be a factor in Wall's challenge to researchers to rethink how we define citizen journalism. Taking this idea a step further, Waisbord (2013b, 130) argues that newsgathering is an epistemic community that "produces a form of knowledge that results from the organization, processing and manufacturing of information." Again, both cases appear to fit the description in the text and visualization content produced but also as knowledge management via the public sharing of crowdsourced data.

Another factor in the analysis of digital humanitarianism and journalism is in the close approximation of the crowdsourcing project management to normative newsroom editorial meetings. SBTF coordinates its information-gathering and crowdsourcing projects through Slack, a proprietary online chat platform, in which SBTF members are invited after successfully completing the organization orientation and information management training modules that borrow extensively from established news resources, like Google NewsLab and the European Journalism Centre.

A thematic analysis of the chat transcripts from the two cases examined here was conducted. Volunteers collectively generated 4709 discreet lines of conversation about the two respective projects. The Internews project generated 1460 transcript discussion lines over seven days, for an average of 209 exchanges between the volunteers per day, to coordinate the typical activation of data crowdsourcing and information hand-off. In contrast, the more complicated earthquake citizen journalism project of self-activation/self-publication generated more than twice as many exchanges. A net 3249 lines of

discussion were tallied from Slack over the seven-day earthquake project period, for an average of 464 exchanges between volunteers per day.

The conversations in both cases focused substantially on source and data verification concerns. But not unexpectedly, the self-activation project also produced a considerable amount of discussion about story framing and editorial judgements about the information needs for professional humanitarian users versus crisis-affected people. Citizen journalism as a form of knowledge-search method, as Aitamurto (2015) contends, could offer one possible interpretation for the difference in conversational engagement in the two cases due to the added complexity and sophistication of independent, self-published citizen journalism. It is an intriguing finding in the preliminary analysis but further study is needed.

Conclusion

Citizen journalism is a dynamic field that continues to reinvent itself—adapting to new social contexts and with the advent of new communication, collaboration, information management and social computing tools. The importance of this study is to document an emerging new form of citizen journalism arising from the desperate early moments of a humanitarian crisis, often before professional newsrooms can deploy reporters. While the concept of digital humanitarianism is well studied in other academic disciplines, it has not been extensively examined in media studies or journalism literature.

The expertise of digital humanitarians in using technical tools to curate data is worlds apart from typical user-generated content. It is more akin to the emerging examples of interpretative, collaborative and brokering citizen journalism activities that have surfaced by necessity in conflict zones too remote or too dangerous for non-local reporters. Poised between participatory, co-creative and independent citizen journalism, these crisis and conflict examples suggest both a need for new definitions and new ways of thinking about citizen journalism that are not bounded solely by the eyewitness user-generated content frame.

This exploratory case study, however, is limited in nature and should be considered as an initial probe into a new phenomenon. The preliminary findings indicate that more rigorous methodological study appears to be warranted.

With the current limitations in my mind, this study suggests a number of potentially interesting opportunities to explore additional examples of crisis-related citizen journalism further.

One possibility is to investigate the interpretive layer of crowdsourcing and collective intelligence as instances of data-driven, knowledge-search citizen journalism. A related line of inquiry could compare the rise of expertise-driven citizen journalism that avails itself of sophisticated technology, like social computing, data analysis or peer-to-peer networking, with traditionally produced professional journalism.

Another contribution to the literature is to explore new thick descriptions of non-professional reporting and its possible intersections with media sociology frameworks (Reese and Shoemaker 2016) and social theory to address concerns about lopsided power relations between crisis-affected people and the big data they create from their social media traces. The research gap between citizen journalism and theory-building (Wall 2015) could be addressed through the convergence of digital humanitarianism and crisis news due to its collaborative social nature, technology-centric approach and global diversity.

For instance, theories that explain professionalism, such as expertise, duty and autonomy (Örnebring 2013) or news conventions and boundary setting (Lewis 2012) could provide a rich examination of the tensions between professional and amateur news produced by members of the public who are subject matter experts. Likewise, ethnographically inspired study of the open, intrinsically collaborative ethos of peer-to-peer networks (Benkler 2006; Van Der Haak, Parks, and Castells 2012) and its influence on citizen journalism could also add important new interdisciplinary perspectives to the field.

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REFERENCES

Aitamurto, Tanja. 2015. "Crowdsourcing as a Knowledge-Search Method in Digital Journalism: Ruptured Ideals and Blended Responsibility." *Digital Journalism*: 1–18. doi:10.1080/21670811.2015.1034807.

Allan, Stuart. 2013. *Citizen Witnessing - Key Concepts in Journalism*. Cambridge: Polity Press.

Allan, Stuart, and Chris Peters. 2015. "The 'Public Eye' or 'Disaster Tourists.'" *Digital Journalism* 3 (4): 477–494. doi:10.1080/21670811.2015.1034517.

Andén-Papadopoulos, Kari, and Mervi Pantti. 2013a. "Re-imagining Crisis Reporting: Professional Ideology of Journalists and Citizen Eyewitness Images." *Journalism* 14 (7): 960–977. doi:10.1177/1464884913479055.

Andén-Papadopoulos, Kari, and Mervi Pantti. 2013b. "The Media Work of Syrian Diaspora Activists: Brokering Between the Protest and Mainstream Media." *International Journal of Communication* 7: 2185–2206. http://ijoc.org.

Benkler, Yochai. 2006. *The Wealth of Networks*. New Haven: Yale University Press.

Brabham, Daren C. 2013. *Crowdsourcing*. Cambridge, MA: MIT Press. http://www.myilibrary.com?ID=485159.

Burns, Ryan. 2015a. "Digital Humanitarianism and the Geospatial Web: Emerging Modes of Mapping and the Transformation of Humanitarian Practices." *ProQuest*. http://0-search.proquest.com.libraries.colorado.edu/docview/1722049030?pq-origsite=summon&accountid=14503&selectids=10000115,10000021,1006269,1008042.

Burns, Ryan. 2015b. "Rethinking Big Data in Digital Humanitarianism: Practices, Epistemologies, and Social Relations." *GeoJournal* 80: 477–490. doi:10.1007/s10708-014-9599-x Rethinking.

Campbell, Alison. 2015. "Information Is Aid." *Internews (Blog)*. http://www.internews.org/our-stories/project-updates/information-aid-syrian-refugees.

Chapelier, Carole, and Anita Shah. 2013. "Improving Communication between Humanitarian Aid Agencies and Crisis-affected People." London.

Collins, Katie. 2013. "How AI, Twitter and Digital Volunteers Are Transforming Humanitarian Disaster Response." *Wired*. http://www.wired.co.uk/news/archive/2013-09/30/digital-humanitarianism.

Conneally, Paul. 2015. "Digital Humanitarianism." In *Humanitarianism, Communications and Change*, edited by Simon Cottle and Glenda Cooper, 61–64. New York: Peter Lang. http://www.peterlang.com/download/datasheet/85909/datasheet_312526.pdf.

Crawford, Kate, and Megan Finn. 2015. "The Limits of Crisis Data: Analytical and Ethical Challenges of Using Social and Mobile Data to Understand Disasters." *GeoJournal* 80 (4): 491–502. doi:10.1007/s10708-014-9597-z.

Creswell, John W. 2003. *Research Design: Qualitative, Quantitative and Mixed Methods Approaches*. 2nd ed. Thousand Oaks, CA: SAGE.

Dailey, Dharma, and Kate Starbird. 2014. "Journalists as Crowdsourcerers: Responding to Crisis by Reporting with a Crowd." *Computer Supported Cooperative Work (CSCW)* 23: 445–481. doi:10.1007/s10606-014-9208-z.

Digital Humanitarian Network. n.d. "Partners | DHN." http://digitalhumanitarians.com/partners.

Downman, Scott. 2013. "Reporting Disasters from Inside a Repressive Regime: A Citizen Journalism." *Australian Journal of Communication* 40 (1): 153–172.

European Journalism Centre. 2014. *Verification Handbook: Homepage*. First. Maastricht: European Journalism Centre. http://verificationhandbook.com/book/chapter7.php.

Eurostat. 2016. "Record Number of over 1.2 Million First Time Asylum Seekers Registered in 2015." *Eurostat*. Luxembourg City, LU. http://ec.europa.eu/eurostat/documents/2995521/7203832/3-04032016-AP-EN.pdf/790eba01-381c-4163-bcd2-a54959b99ed6.

Global Solutions Network. 2014. "Digital Humanitarian Network: Leveraging Digital Networks for Humanitarian Response - Lighthouse Case Study." http://gsnetworks.org/wp-content/uploads/Digital-Humanitarian-Network.pdf.

Hieber, Loretta. 2001. "Lifeline Media Reaching Populations in Crisis. A Guide to Developing Media Projects in Conflict Situations."

Howe, Jeff. 2006. "The Rise of Crowdsourcing." *Wired Magazine*. http://www.wired.com/2006/06/crowds/.

Hughes, Amanda Lee, and Andrea H. Tapia. 2015. "Social Media in Crisis When Professional Responders Meet Digital Volunteers ." *Homeland Security & Emergency Management* 12 (3): 679–706.

Imran, Muhammad, Carlos Castillo, Ji Lucas, Patrick Meier, and Sarah Vieweg. 2014. "AIDR - Artificial Intelligence for Disaster Response." In *WWW'14 Companion*, 1–5. Seoul, Korea: ACM. doi:10.1145/2567948.2577034.

Internews. 2015. "European Refugee Response." *Humanitarian Data Exchange*. https://data.humdata.org/dataset/european-mediterranean-refugee-response.

Kawulich, Barbara B. 2005. "Participant Observation as a Data Collection Method." *Forum: Qualitative Social Research* 6 (2). http://nbn-resolving.de/urn:nbn:de:0114-fqs0502430.

Lewis, Seth C. 2012. "The Tension between Professional Control and Open Participation." *Information, Communication & Society* 15 (6): 836–866. doi:10.1080/1369118X.2012.674150.

Lewis, Seth C., and Oscar Westlund. 2015. "Big Data and Journalism." *Digital Journalism* 3 (3): 447–466. doi:10.1080/21670811.2014.976418.

Ley, Benedikt, Thomas Ludwig, Volkmar Pipek, Dave Randall, Christian Reuter, and Torben Wiedenhoefer. 2014. "Information and Expertise Sharing in Inter-organizational Crisis Management." *Computer Supported Cooperative Work (CSCW)* 23: 347–387. doi:10.1007/s10606-014-9205-2.

Ludwig, Thomas, Christian Reuter, and Volkmar Pipek. 2013. "What You See is What I Need: Mobile Reporting Practices in Emergencies." In *ECSCW 2013: Proceedings of the 13th European Conference on Computer Supported Cooperative Work*, edited by Olav W. Bertelsen,

Luigina Ciolfi, Maria Antonietta Grasso, and George Angelos Papadopoulos. Paphos, Cyprus: Springer. doi:10.1007/978-1-4471-5346-7.

Ludwig, Thomas, Christian Reuter, and Volkmar Pipek. 2015. "Social Haystack: Dynamic Quality Assessment of Citizen-Generated Content During Emergencies." *ACM Trans. Comput.-Hum. Interact. Article* 22 (17). doi:10.1145/2749461.

Madianou, Mirca. 2015. "Digital Inequality and Second-Order Disasters: Social Media in the Typhoon Haiyan Recovery." *Social Media + Society* 1 (2). doi:10.1177/2056305115603386.

Martin-Shields, Charles. 2013. "The Technologists Dilemma: Ethical Challenges of Using Crowdsourcing Technology in Conflict and Disaster-Affected Regions." *Georgetown Journal of International Affairs* 14: 157–163. doi:10.1525/sp.2007.54.1.23.

McClure, Dan, and Ian Gray. 2015. "Engineering Scale Up in Humanitarian Innovations Missing Middle." In *IEEE 2015 Global Humanitarian Technology Conference (GHTC)*, edited by Paul Wesling, 114–122. Seattle, WA, USA: IEEE. doi:10.1109/GHTC.2015.7343963.

Meier, Patrick. 2013. "AIDR: Artificial Intelligence for Disaster Response." *iRevolution*. https://irevolutions.org/2013/10/01/aidr-artificial-intelligence-for-disaster-response/.

Novak, Julie M, and Kathleen G Vidoloff. 2011. "New Frames on Crisis: Citizen Journalism Changing the Dynamics of Crisis Communication." *International Journal of Mass Emergencies and Disasters* 29 (3): 181–202.

Örnebring, Henrik. 2013. "Anything You Can Do, I Can Do Better? Professional Journalists on Citizen Journalism in Six European Countries." *International Communication Gazette* 75 (1): 35–53. doi:10.1177/1748048512461761.

Palen, Leysia. 2013. "Disaster Management as a Socially Distributed Information System." *Selected Papers of Internet Research 14.0*. http://spir.aoir.org/index.php/spir/article/viewFile/864/442.

Palen, Leysia, Sarah Vieweg, and Kenneth Mark Anderson. 2010. "Supporting "Everyday Analysts" in Safety- and Time-critical Situations." *The Information Society* 27 (1): 52–62. doi:10.1080/01972243.2011.534370.

Paulussen, Steve, Ari Heinonen, David Domingo, and Thorsten Quandt. 2007. "Doing It Together: Citizen Participation In The Professional News Making Process." *Observatorio (OBS*)* 1 (3): 131–154. doi:1646-5954/ERC123483/2007 131.

Phillips, Jennie. 2015. "Exploring the Citizen-driven Response to Crisis in Cyberspace, Risk and the Need for Resilience." In *Humanitarian Technology Conference (IHTC2015), 2015 IEEE Canada International*, 1–6. Ottawa, ON: IEEE. doi:10.1109/IHTC.2015.7238051.

Read, Róisín, Bertrand Taithe, and Roger MacGinty. 2016. "Data Hubris - Humanitarian Information Systems and the Mirage of Technology." *Third World Quarterly*: 1–18. doi:10.1080/01436597.2015.1136208.

Reese, Stephen D. 2016. "The New Geography of Journalism Research." *Digital Journalism* 1–11. doi:10.1080/21670811.2016.1152903.

Reese, Stephen D., and Pamela J. Shoemaker. 2016. "Media Sociology and the Hierarchy of Influences Model a Levels of Analysis Perspective on the Networked Public Sphere." *Mass Communication & Society*: 1–39. doi:10.1080/15205436.2016.1174268.

Shklovski, Irina, Leysia Palen, and Jeannette Sutton. 2008. "Finding Community through Information and Communication Technology During Disaster Events." In *CSCW 08*, 127–136. San Diego, CA: ACM. http://www.ics.uci.edu/~ishklovs/pubs/cscw08.pdf.

Sienkiewicz, Matt. 2014. "Start Making Sense: A Three-Tier Approach to Citizen Journalism." *Culture & Society* 36 (5): 691–701. doi:10.1177/0163443714527567.

Standby Task Force. n.d. "Our Activation Criteria." *Standby Task Force*. http://www.standbytaskforce.org/for-humanitarian-agencies/our-activation-criteria/.

Starbird, Kate, and Leysia Palen. 2013. "Working & Sustaining the Virtual 'Disaster Desk.'" *CSCW Conference Paper*. http://faculty.washington.edu/kstarbi/cscw2013_final-2.pdf.

Sutton, Jeannette, Leysia Palen, and Irina Shklovski. 2005. "Backchannels on the Front Lines: Emergent Uses of Social Media in the 2007 Southern California Wildfires." In *Proceedings of the 5th International ISCRAM Conference*, edited by F. Fiedrich and B. Van de Walle, 624–632. Washington, DC: ISCRAM.

Tapia, Andrea H., and Kathleen Moore. 2014. "Good Enough Is Good Enough - Overcoming Disaster Response Organizations Slow Social Media Data Adoption." *Computer Supported Cooperative Work* 23: 438–512. doi:10.1007/s10606-014-9206-1.

Thorsen, Einar, and Stuart Allan, eds. 2009. *Citizen Journalism: Global Perspectives, Volume 1*. New York: Peter Lang. http://citizenjournalism.me.

Thorsen, Einar, and Stuart Allan, eds. 2014. *Citizen Journalism: Global Perspectives, Volume 2*. New York: Peter Lang. http://citizenjournalism.me.

United Nations Office for the Coordination of Humanitarian Affairs. 2015. "Incorporating Big Data into Humanitarian Opeartions." http://digitalhumanitarians.com/sites/default/files/resource-field_media/IncorporatingBigDataintoHumanitarianOps-2015.pdf.

Van Der Haak, Bregtje, Michael Parks, and Manuel Castells. 2012. "The Future of Journalism: Networked Journalism." *International Journal of Communication* 6: 2923–2938.

Vultee, Fred, and Denise M Vultee. 2011. "What We Tweet About When We Tweet About Disasters: The Nature and Sources of Microblog Comments During Emergencies." *International Journal of Mass Emergencies and Disasters* 29 (3): 221–242.

Waisbord, Silvio. 2011. "Can NGOs Change the News?" *International Journal of Communication* 5: 142–165. http://ijoc.org/index.php/ijoc/article/viewFile/787/515.

Waisbord, Silvio. 2013a. "Post-Professional Journalism." In *Reinventing Professionalism: Journalism and News in Global Perspective*, 202–221. Cambridge, UK: Polity Press.

Waisbord, Silvio. 2013b. "The Professional Logic of Journalism." In *Reinventing Professionalism: Journalism and News in Global Perspective*, 121–148. Cambridge, UK: Polity Press.

Wall, Melissa. 2015. "Citizen Journalism." *Digital Journalism* 3 (6): 797–813. doi:10.1080/21670811.2014.1002513.

Wall, Melissa, and Sahar El Zahed. 2015. "Embedding Content from Syrian Citizen Journalists: The Rise of the Collaborative News Clip." *Journalism* 16 (2): 163–180. doi:10.1177/1464884914529213.

Watson, Hayley. 2011. "Preconditions for Citizen Journalism: A Sociological Assessment." *Sociological Research Online* 16 (3). doi:10.5153/sro.2417.

Watson, Hayley. 2013. "Citizen Journalism as Data for Disaster Research." *International Journal of Mass Emergencies & Disasters* 31 (2): 219–246.

Wright, Kate. 2015. "'These Grey Areas.'" *Journalism Studies*, June 1–21. doi:10.1080/1461670X.2015.1036904.

Yin, Robert K. 2014. *Case Study Research: Design and Methods*. 5th ed. Los Angeles: SAGE.

Ziemke, Jen. 2012. "Crisis Mapping: The Construction of a New Interdisciplinary Field?" *Journal of Map and Geography Libraries* 8: 101–17. doi:10.1080/15420353.2012.662471.

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