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Paper Title:

**Citizen Journalism, Citizen Activism, and Technology:
Positioning Technology as a 'Second Superpower' in Times of Disasters and
Terrorism**

Abstract

This paper presents a qualitative assessment of citizen journalism and activism efforts through the times of the 2004 Indian Ocean Earthquake, the 2005 London Underground and Bus Bombings, and the 2005 US Hurricane Katrina disaster in an effort to examine how the technology industry and the associated industry of journalism is being affected by a new ethic in production and dissemination. This ethic, which welcomes the involvement of amateurs, hackers, gift-givers, and the non-elite community, has created a plethora of open source tools for blogging, wiki development, mobile phone Web publishing, and Internet telephony. These tools were vital to the formation of global citizen journalism and activism initiatives, allowing bottom-up and emergent disaster management support systems to arise from distributed and decentralized global efforts. The immediacy and widespread availability of these tools allowed citizens to function as unintentional, accidental, and incidental journalists, providing first-hand reports when the mainstream media were absent. Citizens stepped forward to lead and develop open source tools to aid missing persons and disaster recovery efforts. A critical assessment of these technologies in terms of access and usage is provided as it relates to participatory journalism, mainstream journalism practice, and global disaster and terrorism initiatives.

Introduction

Citizen Journalism is the latest buzz word to describe a global publishing phenomenon that began as an amateur pursuit but which now has increased fragmentation of the mass media's once passive consumer audience. Fueled by the open source revolution, both technologically and philosophically, citizen journalism was identified as one of the chief threats to a dismantling of media hegemony and mass media power by the most recent State of News Media report (Project for Excellence in Journalism, 2005). The deep-seated fear of an empowered audience by industry executives accustomed to owning the tools of media production and dissemination has led to media skepticism, outright hostility, and slow acceptance of powerful amateur publishing trends that are likely to outlast their current memes and forms.

It is widely considered that the chief trigger event for the growth of the American blogosphere was the September 11, 2001, terrorist attacks in New York City. In commenting on the impact of 9/11 on the phenomenon of blogging, widely-read conservative blogger and University of Tennessee Law Professor Glenn Reynolds (2005) highlighted that "the blogosphere traditionally rallies in crisis." Though blogging was gaining popularity since 1999 due to the early release of such popular open-source blogging toolkits such as Blogger, Groomsoup, and Edit this Page (Blood, 2003), its audience was still confined to a technical savvy group or to early adopters to the technology before 2001. Media consultant, blogger, and director of the New Media program at City College of New York Jeff Jarvis (2005) noted that blogging as platform for public opinion gained critical mass and dissemination in the aftermath of the 9/11 terrorist attacks, giving rise to the term "war-blogging" or "war-blogger" as vivid descriptor for blogging in a post war environment. The post 9/11 climate of shared public voice collided with the development of new blogging technological platforms creating a fertile environment for blogging to gain mass appeal. Many blogging tools were free and available to anyone with an Internet connection. Currently, blogging is growing, both in activity (Sifry, 2005) and in readership (Pew Internet Report, 2005). The growth of the blogosphere as a heartfelt response to tragedy has continued to gain momentum with subsequent disasters and terrorist acts—the subject of this current paper.

To fully understand this powerful amateur publishing trend, it is important to connect the growth of free creative expression to the open source software movement—a movement referring to software projects that release their source code for free via flexible licensing. Open source development, typically using the Linux, Apache, MySQL, and PHP/Python/Perl development framework, has provided a competitive business threat to preexisting forms of elite technology development. Microsoft's Chief Executive Steve Ballmer once called Linux, an open source operating system, "a cancer" to the world of software engineering because of its undervaluing of technical talent through provision of free source code (LaMonica, 2005). The difficulty for traditional mass media outlets to maintain its hegemony over the public has been accentuated by open source blogging platforms. Additionally, the rapid growth of mobile communications industry, which empower citizens to record audio, take video and pictures, and write blog entries from their cell phones and PDAs, has accentuated the mass media's loss of hegemony.

This paper presents a qualitative assessment of citizen journalism and activism through the times of the 2004 Indian Ocean Earthquake, the 2005 London Underground and Bus Bombings, and the 2005 US Hurricane Katrina disaster in an effort to examine how the technology industry and the associated industry of journalism is being affected by a new ethic in technological development. This ethic, expressed in the direct shaping of technology, encourages the donation of free talent, the inclusion of amateur involvement, and the gift-giving of talented hackers and experts to the self-empowerment of citizens. Using science studies theories to frame the disruptive effects of empowering technologies and open source technologies, this paper will examine the actual usage and shaping of technologies as tools for empowering citizens to tell their own stories, create media, and develop community-based tools for citizen mobilization and empowerment outside government and Big Media in times of disasters and crisis.

On a more theoretical note, this paper engages in a critical assessment of the technical advantages laid out by open source advocates and technology enthusiasts as it relates to disaster and terrorism contexts. This paper poses the big question: can technology be positioned by socially minded technologists to work, in the words of Moore (2005), as a "second superpower" in times of disasters and crisis? How can open source software solutions, working in conjunction with existent technological

infrastructures, harness the emergent intelligence and wisdom of communities to enable citizen involvement in framing responses to disaster management? How can technology be creatively used to empower citizens to self-organize outside the auspices of government and Big Media in times of disasters and terrorism? Does everyone have access to these technologies in vulnerable times?

Through examining and analyzing citizen blogs for accounts of citizen journalism, citizen activism, and technology development and use during the times of the 2004 Indian Ocean Earthquake, the 2005 London Bombings, and the 2005 US Katrina Hurricane disaster, this paper assesses the complex relationship between citizens, journalism, and technology in the more recent instances of disasters and terrorism.

Literature Review

Understanding the momentum for open source technological development and shared modalities of production as an alternative to price-based, market value determination is best aided by the appeal to science studies and to the historical intersection among the variables of science, technology, capitalism, control, and power. Though there are some scholars that believe in technological determinism or a technology-led theory of social change, a fair amount of science studies theorists espouse the significance of examining the social factors that shape the choice, development, deployment, and usage of technology through looking at both the stakeholders (insiders) and those denied access (the outsiders). The line dividing these theorists is not exact, though Smith (1994) identified Lewis Mumford, Jacques Ellul, and Langdon Winner as technological determinists in as much as they view technology as a key component of social change. Though Winner has been tagged as a technological determinist, he identified the problem of modern technics not only in technological determinism but in the inherent threats of technical choice in its selected design and arrangement. Winner's exhortation for moral and political principles as guides to technology choices was an attempt to choose "technical regimes compatible with freedom, social justice, and other key political ends... so that institutions would develop in which the claims of technical expertise and those of a democratic citizenry would regularly meet face to face." (Smith, 1994). The ability to shape a technology is also impacted by when one enters in the

development process. Hughes (1987) noted that systems, which have developed momentum or maturity, appear to be tools of technological determinism because they function more as shapers of society due to closure, stabilization, and the technology's role as an infrastructural base for other emerging technologies. Hughes highlighted that the best chance for shaping a technology exists in the early stages when the technology is being negotiated among competing social groups. Referring to the infrastructure of the Internet, Star and Bowker (2002) noted that new media infrastructure, once settled, becomes invisible, and provides an installed base for future developments.

Theorists who decry technological determinism in their exploration of the social forces impacting on the choice, development, and deployment of technology have shown the evolution of technology to be derived from the interrelationships among social variables, often intersecting with science, productivity, progress, capitalism, power, and control. Their focus on the social groups that shape a technology's development and deployment has given historical context and visibility to the forces that have shaped a technology's outcome, issues that often get forgotten when a technology becomes invisible or widely diffused. The opportunistic service of science to capitalism was clear in the ideas of Scientific Management and Taylorism, finding later expression in the Fordism automated assembly line. Through Scientific Management, the application of scientific principles to factory control management methods was devised to organize and control labor through the divorce of the task from the brain (Braverman, 1974). Management dictated to the worker the precise manner in which work was to be performed, robbing the worker of any decision making potential, ideas, imagination, or craft, all in an effort to squeeze as much productivity from the worker as possible. The destruction of the importance of tinkering and self-discovery through amateur exploration was essential to the capitalist period in which the worker was robbed of all control or brainpower over the direction of production. Fordism, whose relative or internal mobilization regimen is described by Robins and Webster (1999) as "a megamachine that paced and disciplined the workforce," enabled capitalism to thrive and consumerism to flourish as demand increased to keep pace with the ever increasing supply bolstered through mind-deadening automated assembly line work. Robins and Webster reframed Luddism through a resistance or protest lens in sharp contrast to its commonplace

derogatory definition as the ignorant hopelessly fighting technical progress. The luddists were dissenters fighting against the inherent destruction of a way of life by industrial capitalism, control, and a negative social reorganization that robbed them of freedom and values. The revival of neo-luddism as a form of resistance in 20th century America has at its core the notion that there is more than one way to resist the tyranny and oppression of technology outside outright rejection of technology.

The growth of the mass media publishing machine in the US was part and parcel of the existing technological infrastructure that cultivated monopolization, concentration, and standardization, beginning with the telegraph. Starr (2004) charted the development of media technologies, citing the press as an important source of the start up capital and early demand for the telegraph. Carey (1992) noted the importance of the telegraph in freeing communications from geography. The resultant impact was the need for an objective, standardized, and packaged news commodity that could be transmitted by wire services to be consumed through news space. The trend of media conglomeration, begun centuries ago, is still pervasive in current mainstream media industry. Project for Excellence in Journalism (2005) noted that though conglomeration slowed down for all of the major mass media in the year 2005, but is still at an all time high. Currently, two-dozen newspapers industries continue to dominate the market both in terms of the numbers of newspapers they own as well as their percentage of the total daily and Sunday circulations. Network TV news is dominated by General Electric, Walt Disney Company, and Viacom. For all three corporations, news is a small percentage of the offerings and revenue earnings. There are three major cable news operations owned by Time Warner, News Corp. and General Electric. Similarly, radio also has a top-heavy ownership pyramid, with Clear Channel Communications dominating the radio market over its next closest rival, Cumulus Broadcasting. Project for Excellence in Journalism noted that the Internet is the only medium that approximates ownership by the people, permitting a vibrant publishing environment outside the controlling influence of the top online news players.

Similar to earlier technologies, the Internet was seized upon by technological enthusiasts as a device that would bring freedom and democracy. Like technological determinists, utopian enthusiasts seized upon the Internet's unique qualities of

interactivity and two-way communication as a signal that democracy would be improved and civic engagement revitalized. Hacker and Dijk (2000) defined digital democracy as “a collection of attempts to practice democracy without the limits of time, space, and other physical conditions, using ICT’s [information and communication technologies] or CMC [computer-mediated communication] instead, as an addition, not a replacement for traditional ‘analogue’ political practices.” Unique qualities of the Internet instill hope in its ability to increase the scale and speed of providing information, make political participation easier, allow new political communities to arise free from state intervention, enable citizens to insert their voice, help remove the distorting mediators, and help solve the problems of representative government (Hacker and Dijk (2000). Hagen (2000) cited that digital democracy is meant to solve the problems of the crisis in political participation and the seeming dysfunctional role of the mass media in the political process. Lee and Frankel (1999) agreed that Internet is suitable for communications because it has low barriers to entry, provides many-to-many communications, is delivered quickly at low cost, and enables decentralized organizing. With the advent of new technologies, some theorists have advocated direct democracy as a viable alternative to governance (Barber, 1984; Budge, 1996; Grossman, 1995) as opposed to representative government.

However, there was no automatic guarantee that the Internet would improve democracy through expanding usage to the common people. As an initial tool of the military and defense, Edwards (1996) highlighted that the Internet was first developed under a command-and-control communications architecture. Before 1991, the lack of a friendly graphical user interface left the Internet in the hands of experts—engineers, programmers, scientists, and academics, who dictated its development. It is during the 1980s before the development of the World Wide Web that the free software revolution, inspired by the MIT researcher Richard Stallman, was initially started as a protest movement against the black boxing of computer software code, commonly called source code. Opposing the commercial and capitalist impulse to market and profit from software development through keeping the source code invisible to tinkering, Stallman’s notion of offering free software through public release of the source code under the General Public

License was part and parcel of his stance on the natural rights to which individuals are entitled, popularized by the slogan “free as in speech, not as in beer”.

It was in the late 1990s after the development of the World Wide Web and HTML by Tim Berners Lee that an alternative movement, the open source movement, would gain legs, bolstered by the earlier development of Linux in 1991 by Linus Torvalds (Torvalds, 1999). The open source movement shared some of the similar principles of the free software movement, with the exception that it was designed to be friendlier to business interests through more flexible licensing. Aware that Stallman’s innate freedom maxim was off-putting to business and commercial interests, the open source movement sold its philosophy through language designed to pose less of a threat to the commercial business models of software engineering. This more congenial language did not prevent monopoly giants such as Microsoft from trying to demonize open source development as an unfair market practice that devalued the worth of the programmer and encouraged stealing of source code without pay.

However, though open source was designed to provide less of a business threat through adopting licensing that allowed for the mixture of proprietary code and open source code, its fundamental principles and its close association with the free software movement has unleashed a post 1990s market principle of software development that is designed to be less monolithic and more bottom-up as opposed to top-down and hierarchical. This new spirit of collaboration and generosity finds expression in such terms as the gift economy, peer-to-peer development, bazaar design, and the hacker ethic. This new proposed model of social sharing, exchange, and cooperation in technological development stands as a new modality of production (Benkler, 2004; Saveri, Rheingold, and Vian, 2005) that is not price-based, firm-based or state-based. This form of social sharing system gained expression in Raymond’s (1997) coining of the “bazaar” form of software development as opposed to a “cathedral” style of top-down management. The new measure of wealth is now conceived in the development of networks and the fostering of conversations that reap benefits larger than the sum of each individual person (Reed, 1999). Leadbeater and Miller (2004) describe this pro-amateur revolution as a “new distributed organizational model(s) that will be innovative, adaptive, and low cost.” Current successes in open source development include Linux, an open source operating

system, Wikipedia, an open source encyclopedia, Apache, an http server, and Firefox, an open source web browser. Current popular blogging applications that power this new trend in amateur or citizen publishing are all built on the open source platform LAMP (Linux, Apache, mySQL, and PHP/Perl/Python). The trend of Web publishing by amateurs has become so aligned with the open source revolution, that this particular form of journalism has often been tagged, “open-source journalism.” The disassociation with the term open source from strictly code to stand for transparency and collaboration through community has enabled the spreading of the open source meme to describe systems that encourage heterogeneous actors to be incorporated in the network. This openness to amateur contributions is in direct contrast to more formal systems of production.

These ideals of increased democracy and freedom concomitant with the open source tag are the backbone behind several theoretical concepts that are associated with open standards in technology. According to Joi Ito (2003), it is important to use the tools and technologies currently under development to further democracy, allowing for the growth of a “functional, more direct democratic system which can effectively manage complex issues.” Using the concept of emergence to describe the growth of a complex system through the collective actions of simple parts of a system, Ito sees the promise of technology in its ability to enable citizens to better “self organize to deliberate on, and to address, complex issues democratically, without one citizen required to know and comprehend the whole.” Ito lauded the importance of tools developed in open communication spectrums to enable access to all people through transparent architecture. Aligning with the emergent democracy concept, Moore (1993) related the Internet and technologies that create global web-enabled initiatives, to a second superpower, where deliberation “is done by each individual—making sense of events, communicating with others, and deciding whether and how to join in community actions.” The second superpower is distributed and bottom-up in organization, flexible and agile in response to outside events, and responsive to the individual wisdom of each person.

This paper examines blogs for evidence of how technology was both shaped and used by ordinary citizens, technologists, and global activists to provide avenues for citizen journalism, citizen activism, open-source software solutions, relief, aid, and an

environment for self-organization, mobilization, and storytelling. Since 1999, blogging platforms have inspired an increase in the development of technologies that enable citizens to publish outside the auspices of traditional media newsrooms. In addition to citizen blogs, this paper also relies on the accounts of mainstream media—newspapers, television, radio—for analysis of how technology was creatively used by citizens to self-empower. Finally, this paper examines the open source technological development strategies used during these times of disasters and terrorism as a tangible citizen response to self-mobilization, both locally and globally, in order to assess its strengths and weaknesses during these vulnerable times.

Disasters, Terrorism, and ‘Open Source’ Journalism

All of the three incidents examined in this paper were identified as critical junctures for both citizen journalism and technology development by Big Media newsrooms and organizations. The December 26, 2004, Indian Ocean Earthquake, which triggered Tsunamis affecting such areas in Southeast Asia and Africa as Thailand, Indonesia, Malaysia, Sri Lanka, the Maldives, Somalia, India, and Burma, was estimated to cause over 175,000 deaths, with the count yet incomplete. As a highly emotional and compelling incident, several tourists became “accidental” “incidental” or “unintentional” citizen journalists, due to being armed with camera-equipped cell phones and digital camcorders. Steve Outing, senior editor of the Poynter Institute, referred to the incident as the “tipping point in citizen journalism” and as the “seminal marker for introducing citizen journalism in the hallowed space that is professional journalism.”¹ John Schwartz of the New York Times noted that “For vivid reporting from the enormous zone of the tsunami disaster, it was hard to beat the blogs” as “technology provided the ready medium for instant news.” Commenting on the role of technology in relief, reconstruction, and software development, University of Tennessee Law Professor and Blogger Glenn Reynolds, blogging for MSNBC, noted that “the self organizing character of the blogosphere has allowed for rapid response as people who want to help have been put together with ways to help.” Interviewed by NPR, Xenia Jardin, blogger for the highly popular blog Boing Boing, stated that she received numerous text messages, photos sent via cell phones, and first person accounts suggesting, “a completely new kind of cultural

phenomenon” in the way that technology and blogs can be created and used to aid individuals in framing response management independently of Big Media and government.²

The July 7, 2005, London bombings, highlighting the creative use of mobile and blogging technology by citizens to tell their own stories, was identified as a turning point for news-gathering and news production by many mainstream media (MSM) outlets in the UK. Helen Boaden, BBC director of news, was cited in the Financial Times as saying that “the gap between the professional and non-professional news gatherers is getting narrower.” Interviewed by Financial Times, Simon Bucks, associate editor of Sky News, identified the moment as “a democratization of news coverage” (Burt, 2005), as it was evident that the story was already covered by the plethora of citizen journalists before Big Media crews arrived on the scene. Many Big Media newsrooms led their television broadcasts and print editions with material captured by citizen journalists, signaling what the widespread acknowledgement of the citizen as a valued source in times of terrorist attacks. According to the British Guardian (2005), “Mobile phone video clips and stills were posted on the Internet sites alongside first-hand accounts of people’s experiences, building up a vast catalogue of DIY coverage more comprehensive and wide-ranging than anything available through the mainstream media.”

When hurricane Katrina hit the US, both media and citizen journalism bloggers were not caught unprepared like the previous cited incidents. According to Mark Glaser of the Online Journalism Review (2005), “the watershed for online journalism has been laid bare. Hurricane Katrina brought forth a mature, multi-layered online response that built on a sense of community after 9/11, the amateur video of the Southeast Asian Tsunami disaster and the July 7 London bombings.”³ Like the two previous incidents, the US Katrina Hurricane disaster, which affected mostly the southern areas of New Orleans, Louisiana, Mississippi, and Alabama, wreaked havoc in terms of causing over 1,300 deaths, displacing many of the residents of the New Orleans city to neighboring states. Residents who remained trapped were mostly the poor black population, confounding the significance of the tragedy as the country assessed its racial and class divides when help was slow in coming to these people. These divides were also manifested in the access to technology. The dangers of a broken telecommunications infrastructure was all too evident

in the stories of exaggerated criminal behavior and surreal rumors in the overcrowded Superdome and Convention center where these trapped residents were given shelter.

Yet, for the more affluent with an Internet connection, the atmosphere was ripe for citizen journalism to provide vivid, raw, and unrelenting critical detail of the slow response of Washington politicians in responding to the disaster. Additionally, MSM media such as CNN, MSNBC, The New York Times, the Washington Post and the BBC, all openly advertised for citizen journalism content on their news home pages.⁴ Some questioned the sincerity of the Big Media's call for citizen contributions through their creation of visual demarcations between citizen and professional contributions.⁵ Yet, as the Web was tuned into a massive bulletin board of missing person's registries held on public and private Web site domains, both amateur and professional journalism was viewed in a complementary as opposed to oppositional relationship. According to Mitch Gelman, executive vice president of CNN.com, "Traditional journalism is on the outside looking in....Citizen journalism is in the inside looking out. In order to get the complete story, it helps to have both points of views" (Gonzales, 2005).

Mobile Technologies

Any discussion of the role of mobile technologies in documenting disasters and terrorism invokes Rheingold's (2003) coinage of the term smart mob to refer to the coordinated political acts of a technology-empowered mobile communications crowd.⁶ Interviewed by John Schwartz (2004) of the New York Times, Rheingold commented on the use of interactive technologies like text messaging that, "If you can smartmob a political demonstration, an election or urban performance art, you can smartmob disaster relief."

It is important to note that cell phones have functioned as a double-edged sword for empowerment and repression. The terrorist attacks in Madrid, Spain, in March 2004, were initiated by detonating bombs using cell phones that killed approximately 200 people. The fear that cell phones could have been responsible for coordinating the July 7, 2005, London bombings led New York's Metropolitan Transportation Authority and the Port Authority of New York and New Jersey to cut cell-phone service in the tunnels that linked Manhattan with New Jersey, Brooklyn and Queens in the immediate aftermath of

the London bombings.

The 2004 Indian Ocean Tsunami disaster was well documented in an emotional and compelling way through “accidental” or “unintentional” citizen journalists equipped with camera-ready mobile phones that were ubiquitous, mainly among the tourist populations. Photo sets of the disaster and of missing persons⁷ were uploaded both to Flickr, a free photo sharing site, and blogs, with content disseminated outside the purview of Big Media Web sites. Tsunami eyewitness Sanjay Senanayake (aka "Morquendi"), a Sri Lankan blogger and TV producer, participated in emergency rescue and relief efforts by providing live text-messages to Rohit Gupta, a blogger in Bombay, who posted the messages as-is to the blog Dogs Without Borders,⁸ providing vital updates that the media were not providing. In the Sri Lankan disaster areas, landlines were down, and mobile phone voice networks were jammed, but Short Message Service (SMS) or text messaging was relatively undisturbed.

One of the more fascinating aspects of mobile phone usage through this disaster was in harnessing a broad, collective participation in fundraising. Using the distributed channels of the mobile phone network, telecommunication carriers working in conjunction with ordinary SMS users, launched fund raising campaigns through using the donations of SMS text messages, raising millions of dollars in aid to the Tsunami-affected region in such countries as Sweden, Norway, The Netherlands, Italy, The UK Germany, France, Portugal, Spain, Greece, the Czech Republic, Switzerland, Belgium Turkey, South Africa, Malaysia, Singapore, South Korea, Hong Kong, Australia, Canada and the USA.⁹ Some governments, notably the Italian government, corresponded with stranded South Asian citizens via SMS, with the message: “From the Foreign Office, please reply by indicating your identity, health conditions and location. Thank you.”¹⁰ It cannot be denied that big telecommunication carriers assisted the stranded. ForgetMeNot Software Limited, the operator of 2-way messaging service ChatBar, permitted free SMS to and from affected countries.¹¹ Asian telecommunication carriers sent SMS messages to the 10,252 phones roaming on Sri Lanka’s network giving the owners a number to call for help. Undeniably, digital divides were evident in who had access to usable technology. The South Asian governments lacked access to an early warning system plan

or an SMS-equipped mobile communications system plan for disaster management. Wealthier tourists, armed with the latest technologies, were better equipped to receive early warning messages and 'smart mob' the disaster via equipped mobile technologies when compared to the local residents.

The recent London bombings on July 7, 2005, and to a lesser extent July 21, 2005, signaled the subversive significance of camera and video equipped mobile phones as an empowering device for citizens, enabling them to provide first-hand reporting of terrorism's impact outside the production of Big Media or government. Writing for the YaleGlobal online, Mark Glaser (2005) noted that on July 7, 2005, within the first 24 hours after the underground and bus bombings in London, the BBC received 20,000 written accounts via e-mail, 1,000 photos, and 20 videos from citizens. Traditional news outlets such as the Guardian and the BBC openly solicited comments, photos, and video from citizens cell phones¹² and the BBC created Web pages to display unedited citizen comments.¹³ No longer solely dependent on mainstream media (MSM) for distribution outlets, citizens created their own news accounts, disseminating their do-it-yourself (DIY) cell phone content through free blogging software and Web sites. Photos taken from mobile phones were uploaded to free photo-sharing sites such as Flickr, using tags or keywords, all now accessible through a community tag pool photoset dubbed '7/7.'¹⁴ Adam Stacey provided one of the first eyewitness images via his camera phone to a moblog called Alfie's Discotastic Moblog¹⁵. The image subsequently made its way to Wikipedia, Sky News, Associated Press, the BBC, and the Guardian, before making its rounds to most US MSM media. The grainy appearance of the cellphone image did not affect its leading role in MSM publications, which a few years ago, would have shunned the picture for its poor quality. The image is now licensed under a Creative Commons' license,¹⁶ a license that allows free usage of the photo by both MSM and the public.

QuickTime™ and a
None decompressor
are needed to see this picture.

The US Hurricane Katrina disaster brought out attempts to merge audio blogging or podcasting with mobile technologies, termed mobcasting. Kaye Trammel, a Louisiana State University professor, used her Blackberry wireless email and cell phone handset to post updates to her blog¹⁷ during the hurricane disaster. Textamerica,¹⁸ a camera phone mobile blog company that offers the public ability to create free moblogs, in partnership with NBC universal, set up a site for posting images from the cellphone via MMS and email.¹⁹ However, mobile communication blogging was not as frequent as in the prior disasters. The lower rate of mobile communications dissemination in the US, coupled with the fact that many who were stranded in the hurricane's path were poor, could be cited as reasons for the lack of mobile usage during this disaster.

There are concerns with the empowerment that citizens can gain with mobile phones. Invoking 18th century utopian philosopher Jeremy Bentham's image of the panopticon—a prison comprised of cells with windows facing inwards where jailers could look out and inspect the prisoners at any time—Charles Stross (2002) writing for then now defunct *Whole Earth* magazine, highlighted the risk of current technologies that permit the construction of a Panopticon Singularity through a society of constant, omniscient surveillance. Freelance writer and blogger Jamais Cascio (2004) noted some of the benefits and drawbacks inherent in the dangers of mobile technologies, paired up

with GPS, GIS, social software, RFIDs and "smart dust", portending the move towards a future society of potentially invisible wearable memory assistants that can record day to day activities in an "always-on" constant fashion, creating a scenario analogous to what he calls the 'participatory panopticon.'²⁰ This pervasive "see, snap, send" impulse identified by Cascio,²¹ promoted through mobile devices such as the network-connected digital camera and the wireless cameraphone, was elaborated upon by the said author at the 2005 MeshForum conference in Chicago:

This won't simply be a world of a single, governmental Big Brother watching over your shoulder, nor will it be a world of a handful of corporate siblings training their ever-vigilant security cameras and tags on you. Such monitoring may well exist, probably will, in fact, but it will be overwhelmed by the millions of cameras and recorders in the hands of millions of Little Brothers and Little Sisters. We will carry with us the tools of our own transparency, and many, perhaps most, will do so willingly, even happily.

This bottom-up or inverse version of citizen surveillance has been captured by the neologism *sousveillance*, a term coined by Steve Mann (no date), professor in the department of electrical and computer engineering in the University of Toronto, to suggest citizen's watching from below, an inverse positioning that can destroy Big Brother's "monopoly on surveillance." But, the dangers of the always-one panopticon, and the fear of the loss of public privacy as a result of citizens recording the actions of others, led Glaser (2005), writing for the *Online Journalism Review*, to question whether citizen journalists were turned into citizen paparazzi as by-standers trampled over victims to get the best pictures in the immediate aftermath of the London bombings.

PicturePhoning.com, a blog that chronicles the use of mobile phones in citizen activism, commented on the 29-year-old Naulchawee in the Tsunami-devastated region who, like many other spectators, was posing for a photo alongside the bodies of dead children.²²

Many fake Tsunami photos that were also disseminated via the Internet in the guise of the real incident.²³ UK newspaper *The Age* (2005) newspaper reported on the bogus emails being sent out after the Tsunami asking for aid donations, and the misleading SMS

messages being sent out warning of food-borne viruses in the seafood. Dan Gillmor,²⁴ once a traditional journalist working for the San Jose Mercury News, and now a full-time advocate of citizen journalism, noted that this new public transparency and voyeurism will inevitably necessitate both the redrawing of cultural norms of behavior for what is ethically acceptable to record and the idea of what it means to be entitled to a sense of privacy in public spaces (Glaser, 2005).

Blogs

Free blogging software has been one of the most significant factors contributing to the loss of Big Media hegemony as news production and dissemination toolsets have now been democratized to the masses. Blogging has had a short history. Pyra Labs' cofounders Evan Williams and Meg Hourihan launched the first blog tool, Blogger, in 1999, allowing free usage. Google bought out the company in 2003. Other early blog tools included Pitas in July 1999 developed by Andrew Smales, a programmer in Toronto, Paul Kedrosky's GrokSoup in 1999, and LiveJournal created in March of 1999. LiveJournal was acquired by the company Six Apart in Jan 2005. Six Apart's blog tools included the release of Movable Type 1.0 in 2001, and Typepad in 2003. An open source tool, Wordpress, was launched in 2003, and the latest tool, MSN Spaces was launched in 2005. It is in blogs that many new media advocates of digital democracy find promising home in the tool's ability to reconnect to the common masses. It is hard to dispute the potential in blogs. David Sifry, cofounder of blog aggregator Technorati, found that the number of created blogs has been doubling every five months for the past 3 years.²⁵ Currently, Technorati is tracking 19.6 million blogs.

Citizen journalists used blogs both to document their experiences in dealing with the disaster/terrorist act, and to provide an activist stance against unfortunate circumstances. Staff writer Lisa Priest of the Globe and Mail referred to the Internet as the "eyes and ears of the tsunami disaster". In examining the 2004 Indian Ocean Earthquake disaster, several blogs functioned as lifelines when it was said that the government was withholding information or the media was too slow to release timely updates. Commenting on the significance of blogs, blogger Evelyn Rodriguez who has been widely interviewed by Big Media upon her survival after being caught in Phi Phi,

Thailand due to the Tsunami, saw the significance of blogs during this time period in its role in information exchange, as a change agent, bringing the story closer, and in its public platform function.²⁶

Many blogs provided direct first-person accounts or published first hands accounts sent in by others about the disaster²⁷, providing updates not covered in MSM.²⁸ Bloggers also used their blog to coordinate relief and a roundup of both traditional and smaller charities:²⁹ bloggers at the World Changing blog worked in conjunction with the Architecture For Humanity Site to create fundraising goals for the South Asian people.³⁰ Within 12 hours after the Tsunami disaster, Peter Griffin, a communications consultant in India, worked in conjunction with Indian bloggers Dina Mehta and Rohit Gupta of the WorldChanging blog to create the SEA-EAT blog.³¹ As clearinghouse for resources, aid, donations and volunteer efforts, this blog reported in its early development on December 28, 2004, to have over 21,000 visitors in 24 hrs with at that time 30 contributors,³² more of an audience that many Big Media sites or governmental organizations. According to Phil Nobel of PoliticsOnline's (2005), the SEA-EAT blog moved to the 10th most visited humanitarian site on the Web, encouraging widespread financial contributions. A site was developed as a Tsunami warning tracker.³³ Many citizen journalism blogs functioned as virtual lightposts for the missing.³⁴

Many trace the rise of citizen journalism videos or the phenomenon of video blogging to the Tsunami disaster. Many tourists shot videos from their cell phones and portable digital camcorders, posting them to blogs and Web pages for viral dissemination.³⁵ Cheese and Crackers, a site developed by a 21-year old US undergraduate student Jordon Golson, became a clearinghouse for Tsunami amateur video and videoblogging, which was eventually picked up on from Big Media. The inability of the site to host all of the amateur video due to bandwidth limitations led anonymous benefactors, one being the Internet archive, to host the video.³⁶ Other sites arose to provide mirroring to the Cheese and Crackers site.³⁷

Like the Tsunami incident, many Londoners responding to the July 7, 2005 terrorist attacks posted their mobile phone pictures to blogs. However, unlike the Tsunami where the residents there operated for the most part independent of Big Media, Londoners anxiously sent in their photos and videos, shot from cell phones, to

encouraging Big Media organizations such as the BBC, the Guardian, and Sky News. Yet, blogs still play a noted part in the public's articulation of the disaster,³⁸ largely in part because of the availability of free and cheap blogging platforms. Editor, writer, and blogger Tim Porter, a US Blogger, noted that the "first day no longer belongs to reporters," particularly since technologies allow citizens to cover the news with greater updates than a newspaper delivered to one's house the next day.³⁹ Porter identified a shift in the importance of Big Media due to the proliferation of citizens media, afforded by free publishing blogging outlets.

Unlike the first two incidents, the US media were not caught off-guard for the Katrina Hurricane Disaster, with many setting up media blogs posting up-to-date entries from the scene of the disaster.⁴⁰ Losing vital infrastructure related to its print publications, the New Orleans's NOLA turned its entire newspaper into a blog, allowing citizen contributions to be added, unedited to its site, while providing a major public service both to its citizens and to the New Orleans police department looking to rescue trapped survivors. Several citizen journalism blogs arose to record first-hand experiences of the Katrina disaster,⁴¹ with many providing a platform to voice strong opinions on governmental neglect, as well as race and class issues. One of the best citizen-journalism blogs was the Slidell Hurricane Damage Blog,⁴² run by Brian Oberkirch, which provided hurricane information and vital updates on a hyperlocal scale to the residents of Slidell, Louisiana. On a live panel session at an Austin one-day conference titled, The Blogging Enterprise,⁴³ Oberkirch noted that they had 85,000 visitors in the first few weeks, with the site now permitting disaster victims to also post information to the Weblog via email⁴⁴ or through a form-based tool.⁴⁵ Reflecting on the significance of the site in its ability to post eyewitness accounts, amateur photos, and direct official information, Oberkirch noted that "the blog posts became the virtual lightposts people used to tack up 'missing' notices, a la 911."⁴⁶ Another well-read blog was the Interdictor, a LiveJournal blog⁴⁷ by Michael Barnett, a previous consultant for DirectNIC, who remained among others in the 10th floor of a 27th floor building in New Orleans providing vital updates on the state of city's destruction. His blog was closely watched by many Big Media outlets who turned to many citizen journalism sites for the inside information they could not provide. Blogs arose to provide access to shelter and housing for the evacuees.⁴⁸ Another

blog provided reconnection services to the displaced.⁴⁹ Some other blogs questioned the racist nature of AP reporting, which made distinctions between white and black residents who were taking food without paying.⁵⁰

Political bloggers used the blog medium to engage in more activist activities. Political blogger Josh Micah Marshall produced a community-developed Katrina timeline of events through open collaboration with his online blog readers.⁵¹ A famous audio mashup, "George Bush Don't Like Black People,"⁵² was loaded to the free citizen's media storage site OurMedia,⁵³ and circulated across the Internet as one of the top downloads. Many conservative bloggers turned their activities towards the constructive act of raising money for relief. Forming a blogging for relief weekend, a total of 1,877 mostly conservative blogs⁵⁴ participated in raising \$1,347,493 million in donations. NZ Bear maintains a new site called Relief Connections with the express goal of facilitating an organization where communities, religious organizations, and civic groups can go online to meet other groups that can aid in recovery.⁵⁵ Maintaining political divisions in the blogosphere, left-leaning bloggers formed their own relief fundraising drive through dropcash⁵⁶ raising slightly under \$200,000. As opposed to generating relief aid, most left leaning political bloggers used their blog as a platform to deliver a harsh critique of the Republican government for what was perceived an overt neglect of the black and the poor in the city of New Orleans.

The robustness and internal logic of the networked blogosphere can be seen in the news feeds that aggregated the blogs postings on each of these events. Working off of the individualized tags or categorizations that each blogger used for their postings, the brainpower of the community's wisdom was gathered through accessing feeds or aggregations of the blogger postings on the Tsunami,⁵⁷ the London bombing incident,⁵⁸ and the Hurricane Katrina incident.⁵⁹ Working directly off of the user-generated tags, termed folksonomies, as opposed to top-down delivered tags, termed taxonomies, it was not uncommon to see many feeds for each topic in the distributed network of the blogosphere. Tag feeds remind us that the power of blogs is in its networked conversations, conferring authority to no one specific blog or elite institution, but spreading power end-to-end by permitting a shared, community structure to emerge from the blogosphere's distributed mode of content publishing.

Wikis

Commenting on the role of Wiki news⁶⁰ and Wiki journalism, CNET News (2005) noted that Wikinews, in conjunction with other volunteer-collaborative sites “are quickly being recognized as important gathering spots not only for news accounts but also for the exchange of resources, safety bulletin boards, missing person’s reports, and other vital information as well as a meeting place for virtual support groups.” Wikipedia defines a wiki as a “a type of website that allows users to add and edit content and is especially suited for constructive collaborative authoring.”⁶¹ Like blogs, many Wiki tools such as SeedWiki⁶² and are pmWiki⁶³ are free. Calling the phenomenon wiki journalism, Daniel Terdiman (2005), staff writer for CNET news, noted in another article that “wikis can be a life-saving resource that provides real-time collaboration, instant grassroots news and crucial meeting places where none exist in the physical world.”

In all of the said disaster and terrorism time periods, wikis played a significant role as a collaborative, organizing space for ordinary citizens to discuss and plan for disaster management. Wikis were also used both as a form of creating collaborative news stories and as a way to form citizen activism responses to aid victims with disaster management and recovery across global boundaries. In terms of Wikipedia, Glaser (2005) noted that the citizen-written entry for the “7 July 2005 London Bombings” was edited more than 5,000 times, leading him to state that “reading through those entries is like watching a sausage of news being made by a community, edited and massaged into a historical record.”

One of the biggest trends, initiated from the Tsunami disaster, was the use of Wikis to enable group collaboration of humanitarian resources, relief (financial, food, shelter, technological), and missing person’s sites.⁶⁴ The Wikis demonstrated the global reach of the Tsunami collaboration, providing a transparent framework for the connected community to publicly track the project goals, needs, and resources. Like the Tsunami disaster, the Katrina disaster used wikis as an information space to enable group collaboration and pooling of resources through an open, living document, which was editable by the wired community of mobilized citizenry. One of the earliest wikis was developed to support the Slidell Hurricane blog to ensure that missing person’s names were not buried among the posts.⁶⁵ A global effort to aid Katrina survivors was launched

with another wiki.⁶⁶ A wiki was launched to enable evacuees to find shelter.⁶⁷ Other more notable wikis⁶⁸ were set up to aid disaster planning for future natural disaster occurrences, the most notable being the Recovery 2.0 wiki⁶⁹ with a public goal of providing “a clearing house for independent initiatives towards building reliable web-based platforms for disaster recovery efforts.” This current wiki has information on standards, projects, practices, and open source participatory design, and it lists current projects for such disasters as Katrina, the recent AsiaQuake, and ShelterFinder, the latter which connects homeless to available shelters.

Wikis also provided an environment for Internet telephony. Using a free Internet call program called Skype,⁷⁰ bloggers created what was called a Virtual Call Center for both the Indian Ocean Tsunami disaster and the US Katrina disaster⁷¹, displaying the information on wikis. Blogger Dina Mehta from India participated in both the Tsunami and Katrina projects, and said of her experiences with Katrina that “What amazes me though, is that I can volunteer my time, sitting in my living room at home in Mumbai India, and be of use to help those seeking information about their loved ones who are missing on that other side of the world.”⁷² Mehta’s experiences highlight the significance of the free tools of Wikis and Skype to fostering global interconnections among common citizens in times of disaster management. Mehta is part of a network of bloggers contemplating how these grassroots call technologies could work in conjunction with SMS-type systems to reach those areas “poorly connected to the Internet” in times of disasters.⁷³ As is evidenced by their current attempts, there is no guarantee that a technology’s development initially serves the interests of everyone. Their overt attempts to shape the creative usage of these technologies are testament to the importance of open standards and flexible architecture in the technology’s infrastructure.

Technological Development and Deployment

What role can citizen’s play in shaping technology’s development and deployment in times of natural disasters or terrorism acts? This paper argues that the availability of open source software, open standards, and open software architectures, a trend that has been developing since the 1980s in software development but which is now gaining momentum in the strong push towards amateur production, was very evident

during the disaster/terrorist times as citizens gave generously of their time and talent through the gift economy to forge local and global connections to construct software that was distributed, bottom-up, and open. Much of this collaboration occurred across global borders in an attempt to empower citizens to self organize outside the auspices of formal organizations. in an end-to-end fashion on the Internet. Commenting on the Tsunami disaster, PoliticsOnline (2005) noted that they witnessed “the truly enormous potential of the Internet come to life - the power of the Internet to instantaneously link millions of people together in a common and concerted effort with real and tangible results.”

Many of the technological blogs showcased the enormity of the technological gift giving and generosity that abounded during these crisis times. For the 2004 Indian Ocean Earthquake, Priya Prakash developed a free mobile Tsunami Helpline WAP site called Tsunami Helplines⁷⁴ viewable only on a WAP compatible browser on a mobile phone. Developed specifically for mobile devices, the technology was devised for victims with limited access to computers, limited knowledge of who to call for medical aid, or for fieldworkers wanting to find out consulate/local hospital/authorities emergency helplines for victims/relatives. Bloggers and technologists offered donations of time to the setting up wireless networks and the installing of computer equipment to ensure the survivors had the connectivity necessary to correspond with friends, family, and governments.⁷⁵

Regarding the Indian Ocean Earthquake disaster, many technical bloggers turned their attention to the lack of a proper SMS warning system in the region and offered both quick technological solutions and advice on the proper method of technological deployment in these regions. The significance of blogs and RSS syndication, the latter an XML file that provides newsfeeds, were vital to connecting global bloggers with interest in assisting in designing technological solutions. BBC correspondent Clark Boyd (2005) details how a Trinidadian blogger, Taran Rampersad, responded to the call from Sri Lankan blogger Sanjaya Senanayake’s blog to make better use of SMS in mobile networks. Rampersad’s call for a SMS alert system led to global collaboration on the Alert Retrieval Cache (ARC), a system built in one night with the assistance of text message guru Dan Lane in Britain using open source software. Commenting on the speed of development of the project, Rampersad noted that, “there is a definite lack of a sense of urgency in governmental institutions.”⁷⁶ The ARC project lives on in the Alert

ReCeive and Transmit (ARCTX) project, which has the goal of getting trusted alert operators on an email list where future warnings can be sent out via word of mouth to rural villages in future times of disasters.

Many technical bloggers took to critiquing the disaster response preparedness of the South Asian region, pointing to the necessity of using tailored technologies to respond to the disasters in developing countries. Technical blogger Jamais Cascio of WorldChanging.org warned against centralized emergency infrastructures because of its openness to a central point of failure. Preferring SMS as a more distributed, citizen-led initiative, Cascio noted that SMS initiatives would only have to hit a certain number of phones as opposed to the entire network, to be an effective tool in spreading the word about impending future disasters. According to Cascio:

Imagine a site which collects storm/earthquake/tsunami/disease outbreak/etc. alerts and announcements, making information available by region. You can then register your SMS number or email address with the site, and give it your current location -- changeable as you travel, of course -- so the site can send you updates and alerts. The system could flag those events of particular import, and even provide short safety notices for responding to the particular danger (e.g., "seek higher ground" or "avoid contact with birds"). Imagine how many people could have survived this week's tsunami if a small number had received warnings on their mobile phones and told those around them.⁷⁷

PBS writer Robert Cringley (2004) critiqued the involvement of government, decrying government efforts during times of disasters as slow, mired in bureaucracy, limited in scope and innovation, and limited in scalability. According to Cringley:

Here's the problem with big multi-government warning systems. First, we have a disaster. Then, we have a conference on the disaster, then plans are proposed, money is appropriated, and three to five years later, a test system is ready. It isn't the final system, of course, but it still involves vast sensor arrays both above and below the surface of the ocean, satellite communication, and a big honking computer down in the bowels of the Department of Commerce or maybe at NASA. That's just the detection part. The warning part involves multilateral discussions with a dozen nations, a treaty, more satellite communication, several

computer networks, several television and radio networks, and possibly a system of emergency transmitters. Ten years, a few million dollars and we're ready.

Homeland Security Consultant and blogger David Stephenson (2004) noted elements of disaster-secure technological design, which include that the network design be decentralized, in the hands of the general public, location-based, empowering, two-way, redundant, collaborative, transparent, trustworthy, and IP-based. Rotary World Peace Scholar at the University of Queensland, Sanjana Hattotuwa (2005) acknowledged that though technology is often critiqued because of its limitations when ground infrastructure is destroyed, ICT's can play an important role in medium to long-term needs within developing countries. These needs include technology's role in nurturing change processes, creating mobile telephony and early warning systems, coordinating work of aid and relief agencies, and building secure virtual collaborative workspaces for a discussion of both short-term and long-term knowledge networks both within regions and among relevant diasporic communities.

The conscious shaping of technology to be a tool to serve the people as opposed to the elite was most apparent in the US Katrina Hurricane disaster, where a series of grassroots, open source development projects led to a technological synergy that is currently unparalleled in prior disaster time points. It is impossible to mention all of the technological gift giving and distributed development that occurred during this disaster time period. One big phenomenon was the use of mapping, GPS, and satellite imagery to view the devastation of the city. Mashups, the creative mixing and hacking together of hybrid Web applications out of a multitude of different sources but appearing seamless to the end user, arose combining the latest satellite imagery with maps and geodata to provide local information through using the open Application Programming Interfaces (APIs) of Google Maps and Google Earth. The Katrina hurricane disaster saw the creative reworking of mashups, one notable one conceived of by Jonathan Mendez and developed in under three hrs by Austin-based programmer Greg Stoll tapping into the open Google API to allow people to enter their specific address for damage assessments of their homes.⁷⁸ Arising out of a selfish desire to help his parents, Ryan Singel of Wired News reported that their housing damaging mapping site became "one of the most remarkable" technological efforts, while BBC news declared that the "sheer usefulness of

these mashups is the clearest possible example of how online access to high-quality geographical data is going to change the world.” The site, which currently contains information for Katrina, Rita, and Wilma hurricanes, is testament to how quick technological services can be devised to assist the disaster-stricken populations when APIs remain open to remixing and mashups.

By far, one of the most significant attempts to shape the development of disaster technology as a tool to serve the people was in the positioning of open source solutions to the creation of disaster management technology. There was an outpouring of selfless acts of software development, which led unfortunately to a widespread proliferation of dozens of Katrina missing person’s databases on the Web including Craigslist, making it difficult for survivors to locate the missing.⁷⁹ David Geilhufe, working in conjunction with Salesforce.com, CivicSpace, and central technical experts Ethan Zuckerman, Zack Rosen, and Jon Lebowsky, embarked on a all-volunteer project, the KatrinaPeopleFinder Project, with the central goal of combining all of the missing persons databases and message board data into a single model of a central database⁸⁰ that could be searchable, minimize record duplication, and provide a data specification that could be used to solve the missing persons problem.⁸¹ Breaking up the stages of the project into a technical venture to scrape different databases and a parallel, distributed volunteer data entry process from message boards, a joint effort was achieved among Social Source Foundation, Salesforce.com and CivicSpaceLabs.⁸² Sites were developed for the programmers,⁸³ project leaders,⁸⁴ the data entry volunteers,⁸⁵ and finally the marketers who would assist in getting the word out about the project.⁸⁶ An official open data exchange format called the PeopleFinder Interchange Format (PFIF)⁸⁷ or XML technical specification for exchanging people information was developed to facilitate all of the various databases syndicating information into a single database. The success of the project was its ability to chunk data into recordsets of 25 persons, permitting volunteers to donate only small amounts of time to complete defined tasks. The distributed and collaborative nature permitted over 620,000 data records to be scraped and manually entered by over 3,000 volunteers, distributed and disconnected, between September 3 and September 19, resulting in the data being used by both the Red Cross and Microsoft.

Standing firmly on open source principles of distributed software development,

Geilhufe noted that “Open Source means that no one has to ask permission or buy a license to mount a disaster response.” Geilhufe uses the term ‘social source’ to refer to the “idea that technology can be harnessed for a social mission by employing community development, online community, and web 2.0 strategies.”⁸⁸ In another area, he notes that open source is central: “This is an important theme, the technology has to be pre-positioned, accessible, and you can’t need to “ask permission” or even involve the folks that “own”/maintain the technology to use it for your purposes.”⁸⁹

The proliferation of several custom built databases duplicating lists of Katrina missing persons also led to a long term effort by several blogging technologists to try to attempt better self organization in preparation for future disasters and/or terrorist attacks. The awareness that the strength of the Internet, its distributed noncentralized nature, was also its central weakness in the donation of duplicated time and talent, blogger Jeff Jarvis, new director for the City University of New York and prior creative director of Advance.net, called for an open discussion on the importance of positioning technology to better share information, report and act on calls for help, coordinate relief, connect the missing, provide connections for such necessities as housing and jobs, match charitable assets to needs, and get people connected to world sooner.⁹⁰ Getting attention from a large amount of technical bloggers, programmers, and developers, a meeting of 45 strong was held at the Web 2.0 conference in October 6, 2005, in San Francisco to discuss how to better swarm with more intelligence and with greater communication in times of disasters and terrorism acts. As a result of that meeting, a variety of tools have been set up to facilitate more efficient and effective virtual spaces to discuss more sophisticated technological solutions that prevent duplication and redundancy when creating distributed software for future disasters. The recovery2.0 wiki, list project components that can be helpful in times of disasters: shelter operating system, disaster zone visualization, recovery purchasing, geographic database, phone bank network, donation management, emergency relay service, and a mesh network.⁹¹ The goal: to provide a more transparent infrastructure for future collaboration among disparate developers.

Conclusion

Can technology be pre-positioned through citizen-led initiatives to function as a ‘second superpower’ in times of disasters and terrorism? Are open forms of technologies and new mobile technologies providing greater avenues for cooperation and amateur forms of engagement in journalism and technology? According to Moore (2005):

In the emergent democracy of the second superpower, each of our minds matters a lot. For example, any one of us can launch an idea. Any one of us can write a blog, send out an email, create a list. Not every idea will take hold in the big mind of the second superpower—but the one that eventually catches fire is started by an individual. And in the peer-oriented world of the second superpower, many more of us have the opportunity to craft submissions, and take a shot.

It is undeniable that both there is a new technological and amateur revolution afoot that has empowered many common users to publish their content, ideas, and projects outside the realms of Big Media, government, and big technological corporations. This phenomenon has flourished in recent disaster and terrorism times. Captured in the ubiquity of the term “open source”, technologies ranging from blogs, to wikis, to open source technological pursuits were widespread through all of the data points selected. Free photo sharing sites such as Flickr, free media storage sites such as OurMedia, and blogging syndication services working off of user-generated blog tags, all provided a steady stream of alternative media content for both wired citizens and users desiring more information. The ability to globally collaborate through Skype Internet telephony also allowed interested parties in different countries to work together to frame shared solutions to disaster management. The fact that many of these technologies are “free” has enabled victims and activist to be empowered to self organize.

But, is everyone empowered to act in times of disasters and terrorism? It is clear that participation in this online technological revolution is open only to those who have access to technologies or the skills to use them. Oftentimes, victims of disasters and terrorism are the least connected as technological infrastructure is usually destroyed or jammed. It is clear that each country must frame technological solutions to empower its citizenry dependent on the popularity of the given technology in the country’s context. The question becomes, how do we ensure that those that are disconnected benefit from the advantages of these technologies in times of disasters and terrorism. With the growth

of mobile communications worldwide, particularly in lesser developed countries, SMS seems to be a viable solution to enabling citizen empowerment. As some blogger technologists highlighted, an SMS solution can be helpful for viral message spreading through friend of a friend techniques. All that would be required is a trusted email list of central network actors or nodes for disaster or terrorism response management to be effective. The Alert ReCeive and Transmit (ARCTX) and recovery2.0 are two projects that enable Internet telephony solutions to future disaster response management.

But, with the promise of mobile technology empowerment comes one of the more bigger problems: the threat to individual privacy. As earlier disasters and terrorism acts have shown, the exploitation of disaster times by citizens eager for spectacle has been seen through all of the crisis times cited in this paper. Can we afford to live in a society where everyone is watching everyone? Surveillance and privacy concerns are warranted in this new environment where the tendency for rampant abuse of citizen privacy rights is sanctioned with the new fears of terrorism that abound globally. With the future push in expanding mobile technology, there is a dire need for a redefinition of what constitutes privacy in public spaces.

Undeniably, open, accessible, flexible, and transparent technologies provide the greatest hope for citizens to self mobilize in times of disasters through providing avenues for the enlistment of heterogeneous actors. Citizens used these open and free technologies to create alternative citizen journalism outlets, citizen activism pursuits such as fund raising, relief coordination, and shelter/food drives, as well as devise creative ways to coordinate technological solutions through distributed and global initiatives. The open source revolution, begun in the 1990s on the heels of the free software movement begun in the 1980s, has fueled this new trend towards amateur forms of creativity, be it in journalism or technology. Using science studies to frame this paper's analysis, this new revolution is attacking elite top-down structures that wield power, centralized authority, and economic control over the masses. The importance of maintaining open infrastructures for creative synergies or mashups in the future is underscored by how citizens took advantage of open APIs to provide vital informational services to victims in the said disasters, particularly in the US Katrina incident.

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Notes

- ¹ Steve Outing's entry on the Tsunami coverage is located at http://www.poynter.org/content/content_view.asp?id=76520
- ² Listen to Xenia Jardin's full discussion with NPR at <http://www.npr.org/templates/story/story.php?storyId=4258114>
- ³ See Mark Glaser's story at <http://www.ojr.org/ojr/stories/050913glaser/>
- ⁴ The hypergene media blog has screen captures of MSM's attempt to attract citizen journalism content at <http://www.hypergene.net/blog/weblog.php?id=P298>, <http://www.hypergene.net/blog/weblog.php?id=P291> and at <http://www.hypergene.net/blog/weblog.php?id=P294>.
- ⁵ Foremost among these critiques of the media's presentation of citizen journalism content was Steve Outing of the Poynter Institute at <http://www.poynter.org/column.asp?id=31&aid=87914>
- ⁶ Rheingold has a Web site dedicated to covering smart mob acts across the World at <http://www.smartmobs.com/>.
- ⁷ See Flickr photoset at http://www.flickr.com/groups/tsunami_help_missing/
- ⁸ See the Dogs Without Borders site at <http://securitypipeline.com/56800178>.
- ⁹ To learn more about the details of these SMS fundraising campaigns visit <http://www.textually.org/textually/archives/2005/01/006593.htm>
- ¹⁰ Learn more about this campaign by visiting <http://www.textually.org/textually/archives/2005/01/006600.htm>.
- ¹¹ View the press release for this campaign at http://sourcewire.com/releases/rel_display.php?relid=20266&hilite=.
- ¹² Open attempts to solicit viewer content is accessible at the Guardian's News Blog: http://blogs.guardian.co.uk/news/archives/2005/07/07/your_eyewitness_accounts.html
- ¹³ Read citizen comments on the BBC Web site at http://news.bbc.co.uk/1/hi/talking_point/4659237.stm
- ¹⁴ Photosets of the London bombings are available at <http://www.flickr.com/groups/bomb/pool/>. Some of the more popular tags for photos included London, bombing, bomb, bombings, terrorism.
- ¹⁵ See <http://moblog.co.uk/view.php?id=77571#1120732604> for the blog entry of the photo.
- ¹⁶ For more information on Creative Commons, visit <http://creativecommons.org/>.
- ¹⁷ See article on Kaye Trammell at <http://www.washingtonpost.com/wp-dyn/content/article/2005/09/02/AR2005090202120.html> and http://www.usatoday.com/news/nation/2005-08-29-katrina-blogs_x.htm
- ¹⁸ To create a moblog, visit TextAmerica's Web site at <http://www.textamerica.com/>.
- ¹⁹ See Web site at <http://callhome.textamerica.com/> for details of how this works.
- ²⁰ Read Jamais Cascio's entry on the participatory panopticon at <http://www.worldchanging.com/archives/000554.html>
- ²¹ Read (<http://www.worldchanging.com/archives/000680.html>) for Cascio's account of the send, snap, and see impulse.
- ²² Read about the incident at <http://www.textually.org/picturephoning/archives/2005/01/006594.htm>.
- ²³ Visit <http://www.tsunamis.com/tsunami-pictures.html> to view some fake Tsunami photos.
- ²⁴ Dan Gillmor has wrote a seminal book on citizen journalism titled, We the Media. The book is published under a Creative Commons license and is available entirely online at <http://wethemedia.oreilly.com/>.
- ²⁵ David Sifry's latest State of the Blogosphere report can be found at <http://www.sifry.com/alerts/archives/000343.html>.
- ²⁶ See Evelyn Rodriguez's account of the significance of blogs in the wake of the Tsunami disaster at http://evelynrodriguez.typepad.com/crossroads_dispatches/2004/12/index.html.
- ²⁷ First hand accounts of the disaster are available on such US blogs as <http://www.worldchanging.org> in its December/January archive, and maintaining a good list of first hand accounts at <http://www.worldchanging.com/archives/001814.html>; Boing Boing at <http://www.boingboing.net> in its

December/January archive, Command Post at <http://www.command-post.org/> in its December/January archive. Other first hand accounts directly from the area include blogs <http://www.jeffooi.com/> (Malaysia); <http://waywardmutterings.blogspot.com/> (Sri Lanka); <http://www.thiswayplease.com/extra.html> (Sri Lanka Blogger); <http://2bangkok.com/> (Bangkok blogger). A list of some of the earliest bloggers is at http://www.jeffooi.com/archives/2004/12/tsunami_kills_5.php

²⁸ Ethan Zuckerman writing for WorldChanging noted in his post <http://www.worldchanging.com/archives/001826.html> the lack of availability of information about the deaths in Myanmar due to possible self censorship by newspapers.

²⁹ Blog with a roundup of charities:

http://www.benjaminrosenbaum.com/blog/archives/2004_12.html#000151

³⁰ See World changing's fundraising goals at <http://www.worldchanging.com/archives/001811.html>, <http://www.worldchanging.com/archives/001815.html>, <http://www.worldchanging.com/archives/001820.html>, and <http://www.worldchanging.com/archives/001844.html>

³¹ Blog available at <http://tsunamihelp.blogspot.com/>

³² Post about the statistics and development of the site can be found at <http://www.worldchanging.com/archives/001821.html>

³³ Site available at <http://tsunamiwarning.blogspot.com/>

³⁴ Blog for missing persons located at <http://tsunamimissing.blogspot.com/>

³⁵ Video sites include: http://www.waxy.org/archive/2004/12/28/amateur_shtml, http://www.archive.org/search.php?query=collection%3Aopensource_movies%20AND%20subject%3A%22tsunami%22, <http://www.punditguy.com/2004/12/horror.html>, and <http://www.waveofdestruction.org/>

³⁶ Internet archive hosted video located at http://www.archive.org/search.php?query=mediatype%3Amovies%20AND%20collection%3Aopensource_movies%20AND%20%2Fmetadata%2Fsubject%3A%22Tsunami%22.

³⁷ Golson has a comprehensive list of the mirrored sites at http://www.jlgolson.com/archives/entries/tsunami_video.html

³⁸ Some blogs that contained accounts of the terrorist attacks include Norm Geras' blog at <http://normblog.typepad.com/normblog/>, David Carr, writing for Samizdata at <http://www.samizdata.net/blog/>, Josh Trevino at http://www.spot-on.com/archives/trevino/2005/07/the_bloody_seventh.html, Shot by Both Sides at http://www.stalinism.com/shot-by-both-sides/full_post.asp?pid=1229, and Little Britain at <http://littlebritainlookalikes.blogspot.com/2005/07/london-explosions-pt2.html>. Matthew Sheffield posts some eyewitness commentary at <http://matthewsheffield.blogspot.com/2005/07/terrorism-in-london.html>. Other blogs include Metroblogging London at <http://london.metblogs.com/> and the Londonist at http://www.londonist.com/archives/2005/07/tube_network_do.php. For a good listing of blogs covering the terrorist attacks, see the Wall Street Journal online at http://online.wsj.com/public/article/SB112074780386479568-Fnj6Lqv_Hf1RxCWVSpb8eG0T4pg_20050806.html?mod=blogs (free link).

³⁹ Tim Porter's blog post on the London bombings available at <http://www.timporter.com/firstdraft/archives/000468.html>

⁴⁰ Local news sites that hosted blogs include WWL-TV (<http://www.wwltv.com/local/stories/WWLBLOG.ac3fcea.html>) and The New Orleans Times-Picayune's breaking news feed (<http://www.nola.com/newslogs/breakingtp/>). CNN set up a hurricane blog, as did NPR, MSNBC,

⁴¹ NZ Bear maintains a good list of many of the citizen journalism first-hand blogs at <http://www.truthlaidbear.com/communitypage.php>. Another good listing of some of the top first-hand account blogs can be found at <http://www.prnewswire.com/cgi-bin/stories.pl?ACCT=104&STORY=/www/story/08-31-2005/0004097598&EDATE>.

⁴² The Slidell Hurricane Damage Blog is located at <http://slidell.weblogswork.com/>.

⁴³ Conference Web page available at <http://www.thebloggingenterprise.com/>.

T⁴⁴ For more information on The Blogging Enterprise panel on citizen journalism, see Marketing Blogger Steve Rubel's blog posts covering the forum at http://www.micropersuasion.com/2005/11/the_blogging_en.html.

⁴⁵ The form-based tool is located at <http://seekers.weblogswork.com/>.

⁴⁶ See Brian Oberkirch's assessment of his blog's importance at <http://www.weblogswork.com/?p=290>. Hi

⁴⁷ Michael Barnett's blog, the Interdictor, is located at <http://www.livejournal.com/users/interdictor/>.

⁴⁸ Some of these housing sites included <http://www.katrinahousing.org/>, <http://reliefconnections.org/>, and <http://katrinahome.com/>

⁴⁹ The blog, <http://www.hurricanekatrinasurvivors.com>, and is said to provide services that governments or Big Media traditionally provide.

⁵⁰ See commentary by blogger Ann Marie Coxx aka Wonkette at <http://www.wonkette.com/politics/ap/index.php#finding-versus-looting-123124> and by Michelle Malkin at <http://michellemalkin.com/archives/003439.htm>.

⁵¹ See Josh Micah Marshall's Katrina timeline at <http://www.talkingpointsmemo.com/katrina-timeline.php>. An earlier 9/11 timeline was developed by Cooperative Research by the same collaborative means, found at http://www.cooperativeresearch.org/project.jsp?project=911_project

⁵² Mp3 of the file is located at <http://www.ourmedia.org/node/53964>

⁵³ Visit <http://www.ourmedia.org/> to learn more about this free storage of citizen's multimedia or personal media.

⁵⁴ See <http://www.truthlaidbear.com/communitypage.php> for a list of all participating blogs.

⁵⁵ See <http://www.reliefconnections.org/> for the relief connections Web site.

⁵⁶ See http://www.dropcash.com/campaign/hurricanerelief/liberal_blogs_for_hurricane_relief for the liberal bloggers donation drive.

⁵⁷ Feeds for the Tsunami incident included <http://del.icio.us/tag/tsunami>, <http://kinja.com/user/tsunami-info> and <http://www.flickr.com/photos/tags/tsunami/>

⁵⁸ Feeds for the London bombing incident included <http://www.technorati.com/search/london>, <http://www.technorati.com/search/%22london+explosion%22>, <http://www.technorati.com/search/%22london+bombing%22>, <http://www.technorati.com/search/%22london+bomb%22>, <http://www.technorati.com/search/londres>, and <http://www.blogpulse.com/trend?query1=london+bombings&label1=&query2=&label2=&query3=&label3=&days=180&x=25&y=11>

⁵⁹ Hurricane Katrina feeds included <http://www.katrinafeeds.org>, <http://www.technorati.com/katrina/>, and <http://www.icerocket.com/katrina>

⁶⁰ Wikinews, an experiment by Wikipedia, can be found at http://en.wikinews.org/wiki/Main_Page.

⁶¹ See Wikipedia's entry for the term wiki at <http://en.wikipedia.org/wiki/Wiki>.

⁶² SeedWiki is a wiki farm that permits free wikis and blogs to be created. Visit <http://www.seedwiki.com/> for more information on SeedWiki.

⁶³ pmWiki is a wiki tool that is open source, requiring the tool to be hosted off of server. It is free. Visit <http://www.pmichaud.com/wiki/PmWiki/PmWiki> for more information on the tool.

⁶⁴ See one of the foremost Wikis at <http://www.tsunamihelp.info/wiki/index.php>. Another wiki, set up by Ross Mayfield, is located at <http://www.socialtext.net/tsunamihelp/index.cgi>

⁶⁵ This wiki is available at http://thehughpage.com/Hurricane_Katrina_Help_Page

⁶⁶ This wiki is available at <http://katrinahelp.info/wiki/main.html>

⁶⁷ The shelterfinder wiki is located at <http://katrinahelp.info/wiki/index.php/ShelterFinder>

⁶⁸ The initial wiki for the recovery2.0 effort was set up by NZ Bear and is available at http://www.4setup.com/index.php/Main_Page. The new wiki for the recovery2.0 effort was set up by Ross Mayfield is now located at <http://www.socialtext.net/recovery2/index.cgi>

⁶⁹ View the recovery 2.0 wiki at <http://www.socialtext.net/recovery2/index.cgi>

⁷⁰ To learn more about Skype, visit <http://www.skype.com/>.

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- ⁷¹ The Katrina Skype information is available at the wiki http://katrinahelp.info/wiki/index.php/Katrina_Help_Line.
- ⁷² Read more about Dina Mehta's experiences working with Skype Internet telephony on her blog posting at <http://radio.weblogs.com/0121664/2005/09/08.html#a692>
- ⁷³ To read the post where Mehta reflects on disaster technology coordination, visit <http://radio.weblogs.com/0121664/categories/businessOpportunities/>.
- ⁷⁴ To learn more about the WAP-based application, visit <http://www.priyascape.com/helpline/index.wml>
- ⁷⁵ See entry by Mike Outmesguine on donating of wireless equipment at <http://wireless.weblogsinc.com/entry/1234000207025240/>.
- ⁷⁶ Read more of Taran Rampersad's posting at the World Changing blog at <http://www.worldchanging.com/archives/001869.html>. Rampersad's blog is located at <http://www.knowprose.com/taxonomy/term/45?from=64>.
- ⁷⁷ Read all of Jamais Cascio's blog posting at WorldChanging.org blog: <http://www.worldchanging.com/archives/001828.html>.
- ⁷⁸ The housing mapping site is located at <http://www.scipionus.com>.
- ⁷⁹ See Jeff Jarvis' listing of some of these missing persons databases on his blog at <http://www.buzzmachine.com/index.php/2005/09/03/lists-of-lists-of-the-missing/>. Most of these databases can also be found at <http://del.icio.us/tag/peoplefinder+unstructured>. About.com also maintained a good database link at <http://goneworleans.about.com/od/famouslandmarks/a/findsurvivors.htm>.
- ⁸⁰ The central database is how found at <http://www.katrinalist.net/>
- ⁸¹ For excellent background notes on the development of this project, see David Geilhufe's blog at <http://blog.social-source.com/>.
- ⁸² Social Source Foundation can be found at <http://www.openngo.org/>, Salesforce.com at <http://www.salesforce.com/foundation/>, and CivicSpace Labs at <http://www.civicspacelabs.org/>
- ⁸³ Programmers willing to assist in creating the data specification could organize at <http://www.omidyar.net/group/katrinarefugee/news/1/>.
- ⁸⁴ Organizers and volunteer project leaders could organize at <http://www.omidyar.net/group/katrinarefugee/news/2/>
- ⁸⁵ Data entry volunteers could organize at <http://www.omidyar.net/group/katrinarefugee/news/0/>
- ⁸⁶ Marketers volunteering their services could organize at <http://www.omidyar.net/group/katrinarefugee/news/3/>
- ⁸⁷ See the open data XML data structure format at <http://zesty.ca/katrina/>
- ⁸⁸ See Geilhufe's post at <http://socialsource.blogspot.com/2005/09/why-do-we-need-open-source-nonprofit.html> for more details about the usage of open source to the project's success.
- ⁸⁹ See Geilhufe's post at <http://socialsource.blogspot.com/2005/10/personal-history-of-katrina.html> for more information on the history of the project.
- ⁹⁰ The inaugural post that kicked off the recovery2.0 efforts is located at <http://www.buzzmachine.com/?tag=recovery2&paged=3>.
- ⁹¹ A description of the potential projects is located at http://www.socialtext.net/recovery2/index.cgi?possible_projects.