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Human Rights Resources Profile

Ushahidi

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Overview

Ushahidi is a nonprofit technology organization that specializes in developing free and open source software. The name "Ushahidi" refers to both the organization and its product, the "Ushahidi Platform."

The Ushahidi Platform is a mashup program (or web-application hybrid)[1] that allows for the collection, visualization, and interactive mapping of "crowd-sourced data" of key events, such as riots or violence associated with elections, mass protests, or the aftermath of natural disasters. "Crowdsourcing" refers to a process that allows everyday citizens involved in, or witnessing such events to use cell phones or other mobile web-enable technology to submit short reports to a centralized database. People trained in verifying then post the reports on an incident map in near real-time.[2] Ushahidi has also developed an automated verification program called "Swift River,"[3] which helps streamline the verification process for incoming reports so that volunteers can post to the map more rapidly. The program is a free open-source project available for download at http://ushahidi.com.

Although Ushahidi started in Kenya in 2008, no central office exists. Instead, Ushahidi refers to itself as a "virtual organization," with software developers (both hired and volunteer) from across the globe (Kenya, Ghana, South Africa, Malawi, Netherlands, and the U.S., among other countries)" working as a virtual team through a variety of social media channels.[4]

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[1] A mashup is an application that pulls data and functionality from multiple external sources via APIs, or Application Programming Interfaces, in order to create a new service. For more information and detail, see the article at: http://en.wikipedia.org/wiki/Mashup_%28web_application_hybrid%29

[2] See http://en.wikipedia.org/wiki/Crowdsourcing#Web-based_crowdsourcing for a description of Web-based crowdsourcing. A good example of how volunteers work with Ushahidi to post incidents to the interactive maps is available in the article "Tufts Map Steered Action in the Midst of Chaos" (http://www.boston.com/news/world/latinamerica/articles/2010/04/05/tufts_project_delivered_aid_to_quake_victims/?page=2 Last accessed 11 January 2011). This article describes the efforts of hundreds of volunteers and thousands of translators as they worked to post in-coming SMS reports during the Haiti earthquake of January 2010.

[3] http://www.ushahidi.com/products/swiftriver-platform . Last accessed 11 January 2011.

[4] http://blog.ushahidi.com/index.php/2010/03/30/ushahidis-virtual-team/ . Tools utilized by the team include Skype, email, and a P2 theme for Wordpress that allows constant communication and commentary between team members around the world.

History and Mission

Ushahidi was originally created to help raise awareness of, and mobilize intervention in, the post-election violence in Kenya in January 2008. On December 27, 2007, Kenya's incumbent president, Mwai Kibaki, was declared the winner of that day's presidential election. However, supporters of the Orange Democratic Movement's candidate, Raila Odinga, contested this result, claiming election fraud; independent observers reported that the election was rigged at the last minute to ensure the incumbent's victory. [5] In response to Kibaki's swearing-in, violence erupted across Kenya. At first the violence seemed tied to protests by Odinga supporters, but it quickly morphed into targeted ethnic violence against the Kikuyu people (Kibaki's community). In a particularly brutal moment, fifty unarmed Kikuyus were burned in a church on New Year's Day. [6] Overall, approximately 600 people died and around 600,000 people were displaced.

In response to these events, Ory Okohollo (a Kenyan native and graduate of Harvard Law School), launched the Ushahidi platform to track events as they unfolded. Over the course of several months, thousands of text messages, videos, and photographs were submitted to the nascent platform–largely via cell phones. As described on the Ushahidi website:

> Ushahidi, which means "testimony" in Swahili, is a website that was initially developed to map reports of violence in Kenya after the post-election fallout at the beginning of 2008. Ushahidi's roots are in the collaboration of Kenyan citizen journalists during a time of crisis. The website was used to map incidents of violence and peace efforts throughout the country based on reports submitted via the web and mobile phone. This initial deployment of Ushahidi had 45,000 users in Kenya, and was the catalyst for us realizing there was a need for a platform based on it, which could be use [sic] by others around the world. [7]

Okohollo designed Ushahidi specifically to capitalize on cell phones and mobile access to the web. In Kenya in 2008, mobile phone subscribers outpaced Internet users by nearly 5:1, [8] largely due to Internet bandwidth limitations as well as poor infrastructure of land-based Internet access through telephone wires or cables. Ushahidi allows mobile phones to send text messages (via standard Short Message Service [SMS] communication technologies) or photos or videos (from smart phones with Multimedia Messaging Service [MMS] capabilities) to a local phone number. The message is then passed through FrontlineSMS, an open-source software that acts as a communications gateway between the local "tech hub" and the Ushahidi platform installed on an Internet server.

The Ushahidi platform is open source and modifiable so that any person or organization can set it up to meet their particular needs for the visualization of information. The platform consists of a simple mashup that pulls user-generated material into a Google map to create an interactive interface that allows viewers to visualize particular pieces of information as they are submitted to the system.

Chief Activities

In the field of crisis mapping, the Ushahidi platform is gaining a foothold as an affordable and easy-to-use technology for capturing "distributed" information (or information from multiple and scattered sources) about crisis events and providing a visual representation of the process of the

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[5] http://www.nytimes.com/2008/01/17/world/africa/17kenya.html?_r=2
[6] http://www.newser.com/story/15375/fire-at-church-kills-50-as-riots-in-kenya-rage.html Author's warning: this article contains some graphic images.
[7] www.ushahidi.com/about
[8] http://ruralpovertyportal.org/web/guest/country/statistics/tags/kenya

crisis. [9] Ushahidi accomplishes this through a platform that allows incoming information posted by users to be displayed on an online interactive map in near real-time as events unfold. As stated on the Ushahidi website, "The Ushahidi Platform allows anyone to gather distributed data via SMS, email or web and visualize it on a map or timeline. Our goal is to create the simplest way of aggregating information from the public for use in crisis response."[10] Thus, users can submit digitally created documentation of events they witness via cell phones (e.g., text messages, photos, or video recordings) or any other means that allows access to the Web and therefore to a dedicated instance of the Ushahidi platform.

Participants/Collaboration
Ushahidi works with a number of local and international partner organizations "for pilot projects, academic studies, development & training of the platform," including (but not limited to): [11]

- For platform development
    - iHub
    - Frontline SMS
    - Digital Democracy
    - esri
    - Pamoja Media
    - eMoksha
    - ICT for Peace
    - Small World News

Governance
Ushahidi was registered in 2008 as a U.S. nonprofit organization and has 501(c)3 status. Ushahidi is managed by an international team of directors and overseen by a Board of Directors.[12] Ushahidi funds itself through grant initiatives and user-donations. All development work on the program is voluntary.[13]

Services/Technology Resources

The Ushahidi platform itself is open source and modifiable so that any person or organization can set it up to meet their particular needs for the visualization of information. According to the Ushahidi home page,[14] the platform pulls user-generated material from SMS, email, or Web-based submissions into a Google map application in order to create an interactive interface that allows viewers to see where a particular piece of information was generated or submitted. This is possible because the platform pulls data and functionality from multiple external sources via APIs, or Application Programming Interfaces,[15] in order to create a new service.

Data sources for Ushahidi[16]

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[9] See Patrick Meier's discussion of crisis mapping at iRevolution:
http://irevolution.wordpress.com/2009/08/08/proposing-crisis-mapping/
[10] www.ushahidi.com
[11] http://ushahidi.com/partners
[12] http://ushahidi.com/about-us/team/board-of-directors
[13] Details on the team of directors can be found at http://www.ushahidi.com/team
[14] http://www.ushahidi.com/
[15] See the following article at *The Documentalist* for more on APIs:
http://crlgrn.wordpress.com/2009/09/04/harvesting-and-preserving-twitter-tweets-a-model-from-the-web-ecology-project/
[16] See "mobiles in-a-box: using mobile phones for advocacy" for a general discussion of mobile media formats. http://www.tacticaltechnology.org/downloads/Mobiles.pdf

- **SMS** --Short Message Service
  - **Text messages**—standard protocol across brands of cell and smart phones
- **MMS**--Multimedia Messaging Service
  - **Audio**—sound recordings using a file format called .AMR.
  - **Video**—Most mobile phones use a file format called 3GP
- **Email**
- **Twitter**
- **Instant Messaging clients of various sorts**

Although the Ushahidi organization does not collect and archive the digitally generated text that the program collects, the platform does allow for submitted text to be saved either online or locally on desktops or servers. Each organization decides what they want to keep, how they want to back the data up, and how long they want to keep it.

Technological Challenges: One key challenge the developers face involves devising a way to verify information as it comes into the Ushahidi platform. Currently, verification has to be conducted by a human moderator, but Ushahidi has launched an automated verification system called "Swift River."[17] The program is an automated verification program that matches information across input sources (i.e. multiple SMS or Twitter submissions) to quickly verify reported events. This initiative is designed to help organizations to verify incoming information from a variety of sources, which will help them to deal with and present massive amounts of reliable citizen-generated data in real-time, especially within the first 24 hours of a crisis when information is potentially moving into the database more quickly than human moderators could verify it. According to Ushahidi, the program has generated, "a great deal of interest in this tool for other industries, such as news rooms and brand monitoring groups."[18] That said, an important feature of this program is that it is "untrained," meaning that human moderators do not check the Swift River data to ensure that the program is making the correct matches, thus leading to potential under- or over-reporting of incidents or information.[19]

Downstream uses of documentation

As an organization, Ushahidi focuses solely on the development of the Ushahidi platform. Therefore, it does not collect and archive the digitally generated text that the program collects. However, the platform does allow for submitted text to be saved either online or locally on desktops or servers at the discretion of the organizations that utilize the program. Each organization therefore decides what to keep, how to back the data up, and how long to keep it.

Challenges
    Funding
- Funders:[20]
  - Omidyar Network
  - John S. and James L. Knight Foundation
  - Humanity United
  - John D. and Catherine T. MacArthur Foundation
  - Open Society Institute
  - Google
  - Hivos
  - Mozilla Foundation

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[17] http://swift.ushahidi.com/

[18] *Ibid*

[19] Personal interview with Patrick Ball of Benetech, 25 October, 2010. Mr. Ball is a statistician working on Benetech's Martus program and has reviewed and critiqued both the Ushahidi and the Swift River programs.

[20] http://www.ushahidi.com/partners

- o [Cisco Foundation](#)
- o [Net (2)](#)

Changing technology: According to Ushahidi's developers, the platform needs to be "agnostic," or able to work with as many platforms, tools, and devices (i.e., cell phones, cameras, computers) as possible so that organizations can use the tool with whatever technology or materials they already have. The Ushahidi Lab is constantly working to integrate new devices and platforms into the system as they emerge.[21] For example, the team is creating a smartphone application for sending and receiving rich data from the Ushahidi platform on iPhones, G-Phones, and other multimedia wireless telephone devices.

So that the Ushahidi platform can draw seamlessly from multiple data sources, the developers work to ensure two levels of operability: 1) that software applications that already support information-aggregation get incorporated into the platform; and 2) that the outflow of information from Ushahidi to users can work with different data visualization platforms. Ushahidi currently can draw data from: Twitter, Jaiku, and Instant Messaging clients of various sorts. Platforms like Grip, Many Eyes, GeoCommons, CMS modules (such as Drupal), and blog plug-ins or widgets (e.g., WordPress, Movable Type, Blogger) can read the visual data produced by Ushahidi.[22]

Comparative Landscape
The following organizations or programs do work similar to that of Ushahidi. These brief descriptions are intended to provide a general landscape of the types of initiatives that are currently underway in the fields of crisis mapping and the use of mobile digital technology in human rights documentation and data collection.

Berkeley Human Rights Center: *Building Peace, Seeking Justice: A Population-Based Survey on Attitudes About Accountability and Social Reconstruction in The Central African Republic* (August 2010).[23] This project consisted of a population survey conducted via hand held digital PDA devices that allowed field workers to interview participants in rural areas and then submit data via satellite to a central database. From there, survey data were checked for consistency and outliers by a lead researcher and processed through SPSS to derive patterned results for the population.[24] The study makes no reference to whether and how data might be saved for future use.

Harvard Humanitarian Initiative (HHI):[25] This organization does not provide a means of crisis mapping, but it does provide a forum for crisis-mapping professionals to share information and converse about the roles of interactive maps and digital and mobile technology in crisis response. As stated on the organization's webpage:

> Launched in 2007, HHI's Program on Crisis Mapping and Early Warning (CM&EW) set out to connect an active community of Crisis Mappers and to formalize the field of Crisis Mapping. Between 2007 and 2009, HHI's Program documented best practices and lessons learned through the lens of new technologies and methodologies. In the process, HHI consulted and interviewed some 300 leading scholars, humanitarian practitioners, software and technology experts and important policy makers across numerous fields of expertise.[26]

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[21] http://www.ushahidi.com/lab
[22] See Ushahidi Labs at http://ushahidi.com/lab
[23] Complete report is available as a PDF at http://www.macfound.org/atf/cf/%7BB0386CE3-8B29-4162-8098-E466FB856794%7D/CAR_AUGUST2010.PDF Last accessed 26 January 2011.
[24] *Ibid*, pp 15-16.
[25] http://hhi.harvard.edu/programs-and-research/crisis-mapping-and-early-warning
[26] *Ibid*

<u>MobileActive.com: Ultimate Go-To Resource for Mobile Data Collection</u>:[27] Working in collaboration with the UN Global Pulse (an initiative for inventorying mobile phone data collection projects), [28] MobileActive.com has created a database of projects, tools, and articles related to the many ways digital devices are used to collect field data in human rights and humanitarian work around the world. [29] The database is constantly updated as MobileActive learns about new initiatives, projects, and resources, and is designed to be a catalogue of sorts of technology and research to help aid workers select tools and design protocols for their own initiatives.

<u>Satellite Sentinel Project</u>:[30] Started by George Clooney and John Prendergast on December 29, 2010, the Satellite Sentinel Project uses satellite imagery to monitor potential for violence along the proposed border between north and south Sudan. The project came online just before the South Sudanese referendum for peace, which occurred from January 9 to 15, 2011. The site hosts two key pieces of digitally submitted information: 1) consolidated Web-reports of voter activity and areas of potential violence as a variety of individuals and media outlets followed the referendum;[31] and 2) maps of satellite images taken at regular intervals from satellites as they fly over the region in their daily orbits.[32] Although the site has collected a number of reports, no images have been posted to the maps yet since it went live in early January 2011. The site will remain active for several months after the referendum in an attempt to spot areas of potential violence as they emerge. The hope is that if the Northern Sudanese know that that their actions are being monitored, they will refrain from renewing violence against the Southern Sudanese. The collected imagery will also serve as a means of streamlining international response to potential acts of violence in the area.[33]

<u>Water for People</u>:[34] FLOW (Field Level Operations Watch) Program:[35] The organization Water for People works to establish clean water and sanitation throughout the world with an eye toward significantly reducing (and hopefully eliminating) water-borne illness.[36] As part of this mission, the organization has developed the FLOW program to visually monitor water and sanitation projects to see, "what's on the verge of disrepair, and what's broken."[37] As stated on the Water for People webpage, by:

> Utilizing cutting edge technology, including Android cell phone technology and Google Earth software, FLOW provides anyone on the Internet access to crucial data for projects supported by Water For [*sic*] People. Community members, entrepreneurs, industry professionals, partners, staff and volunteers gather data with an Android phone. At the touch of a button, data flows to the Internet and updates the status of a water point or sanitation solution on Google Maps and Google Earth.[38]

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[27] http://www.mobileactive.org/go-to-mobile-data-collection-resources Last accessed 26 January 2011.
[28] http://www.unglobalpulse.org/projects/inventory-mobile-phone-based-data-collection-projects Last accessed 26 January 2011.
[29] See the database at https://spreadsheets.google.com/pub?key=0AgrRSBfpL7rXdGlEMzhBVXdmZ3o5bXdfLVZGVVU0YlE&hl=en&gid=1 Last accessed 26 January 2011.
[30] http://www.satsentinel.org/ Last accessed 26 January 2011.
[31] http://www.satsentinel.org/reports Last accessed 26 January 2011
[32] http://www.satsentinel.org/maps Last accessed 26 January 2011
[33] See the following press release for more details of the goals of the project: http://www.satsentinel.org/press-release/george-clooney-%E2%80%98-world-watching%E2%80%99-%E2%80%93-new-satellite-sentinel-project-aims-deter-war-sudan Last accessed 26 January 2011.
[34] http://www.waterforpeople.org/ Last accessed 26 January 2011.
[35] http://www.waterforpeople.org/programs/field-level-operations-watch.html Last accessed 26 January 2011.
[36] http://www.waterforpeople.org/about/mission-and-vision/ Last accessed 26 January 2011.
[37] *Ibid*
[38] *Ibid*

Data about the status of different water projects appear on an interactive Google map where users can click on icons to learn about conditions at different geographic points. Water for People intends the maps to be dynamic, meaning that field workers and other authorized users can add updated material to the maps as conditions change on the ground.

Field Conditions and political contexts for Ushahidi
The map below shows how the Ushahidi platform has been adopted by a number of organizations (represented by the red Ushahidi icons) around the world, mostly in Africa. This map from the Ushahidi website only shows a sampling of current Ushahidi projects. In general, the platform has been used in two types of scenarios: to follow *crises* (such as the Haitian and Chilean earthquakes of 2010), or to attempt to follow *political violence* on election days (as used several times in Africa).

Map depicting locations where the Ushahidi platform has been implemented[39]
N.B.: Each red Ushahidi icon on the map represents an implementation of the platform. The map on the website also contains live links to the organizational Web page associated with the platform implementation.[40]

Though the map illustrates broad use of the platform around the world, a closer investigation of the actual websites tied to the red Ushahidi icons reveals that user submission rates to the platform vary widely. Specifically, more than half of the organizations indicated for Africa have collected only 0.5 to 1.5 SMS-generated text reports each day. By comparison, six out of the eight organizations in the United States and Latin America combined have collected (or continue to collect) between 6.01 and 106.10 reports each day (see Appendix A for full statistical data on all of the organizations depicted in terms of number of reports collected, duration of collection periods, and average number of reports collected per day). Some of the likely factors for this disparity include: varying infrastructure and Internet and mobile telephone use; lack of awareness about Ushahidi; lack of a robust infrastructure for civil society and human rights advocacy; low literacy rates; and rate of adoption of new technologies—particularly web-based—in different parts of the world.

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[39] Map courtesy of Ushahidi at http://ushahidi.com/products/ushahidi-platform Last accessed 29 December 2010.
[40] http://ushahidi.com/products/ushahidi-platform Last accessed 11 January 2011

The limitations of literacy and web development have a restraining impact on Ushahidi's usefulness for the widespread collection of citizen-generated digital incident reports during times of crisis or conflict. Nevertheless, the patterns of use depicted on the map and in the usage numbers for individual projects illustrate the clear potential for Ushahidi as a tool for digital activism. In parts of the world where access to the web is good and the population is literate, large numbers of people participate in crisis monitoring by sending in information of events they witness. The use of Ushahidi in Africa (in particular for election monitoring) presents a particularly compelling case for the future of digital activism in human-rights campaigns around the world. As the world catches up with itself in terms of digital savvy and technology literacy, more and more people will be able to contribute to real-time digital efforts to pressure governments and regimes for improved human rights.

Appendix A:
Basic Statistics on Ushahidi Implementations Indicated on
"Figure 5: Map depicting locations where the Ushahidi platform has been implemented"

The tables below represent a summary of data collected by instances of the Ushahidi platform in Africa, the United States, and Latin America. Each table identifies:

1. Country deployed
2. Name of the organization using the Ushahidi platform
3. The purpose to which the platform was put, e.g. monitoring elections, violence, or crises
4. The number of SMS or Web reports submitted to and stored within the instance of the platform
5. The number of days the instance actively collected reports
6. The average number of reports submitted per day (# reports/#days)

Africa: African organizations depicted in Figure 5 using the Ushahidi platform

Country	Organization	web address	purpose	# reports	# days	reports/day
Burundi	Amatoro Mu Mahoro Burundi***	http://burundi.ushahidi.com	election	250	158	1.58
Democratic Republic of Congo	Democratic Republic of Congo: Tracking the East Congo Conflict	http://drc.ushahidi.com	conflict	233	297	0.78
Ethiopia	Ethiopia Vote Monitor*	http://ethiopiavotmonitor.org	election	0	0	0.00
Guinea	Alliance Guinea	www.allianceguinea.org/ushahidi	election	764	116	6.59
Kenya, Malawi, Uganda, Zambia	Stop Stock Outs	http://stopstockouts.org/ushahidi	medical	294	186	1.58
Mozambique	Protage Mosovoto	www.protegemosovoto.org	election	28	31	0.90
Namibia	Namibia Elections 2009**	http://www,nambiaelections09.org/nambia	election	65	1	65.00
Sudan	Sudan Vote Monitor	http://www.sudanvotemonitor.com	election	257	13	19.77
Togo	Togo Elections	https://togoelections2010.com/main	election	21	36	0.58
Uganda	Uganda Witness**	www.ugandawitness.net	conflict	1	1	1.00
Zimbabwe	United for Africa*	http://unitedforafrica.co.za	unknown	0	0	0.00

* The web page is no longer active and no data are available

** Reports were only collected for one day

*** No official count of reports was given, so count estimated by number of reports per displayed per page (19) by number of pages of reports (37)

United States: Organizations in the United States depicted in Figure 5 using the Ushahidi platform

State	Organization	web address	purpose	# reports	# days	reports/day
California	LA Bike Map*	http://www.bikesidela.org/labikemap/	crime	1701	245	6.94
Georgia	Atlanta Crime Map	http://crime.mapatl.com	crime	29813	281	106.10
Louisiana	Louisiana Bucket Brigade*	http://labucketbrigade.org	crisis	2818	2085	1.35
Washington D.C.	Snowmageddon: The Clean Up	www.snowmageddoncleanup.com/main	crisis	321	24	13.38

* Group still actively collecting SMS reports. Figures calculated as of
website visit on 5 October, 2010.

Latin America: Organizations in Latin America depicted in Figure 5 using the Ushahidi platform

State	Organization	web address	purpose	# reports	# days	reports/day
Brazil	Eleitor 2010 Brazil*	http://eleitor2010.com	election	1033	172	6.01
Chile	Chile Crisis Map	http://chile.ushahidi.com	crisis	1198	137	8.74
Columbia	Elections in Columbia 2010**	http://www.eleccionestransparentes.com	election	816	30	27.20
Mexico	Cuidemos el Voto***	http://www.cuidemoselvoto.org	election	760	554	1.37

* Group still actively collecting SMS reports. Figures calculated as of
Website visit on 5 October, 2010.

** Page deactivated when re-visited Oct. 5, 2010

*** No official count of reports was given, so count estimated by number of reports per displayed per page (20) X number of pages of reports (38)