

CROWDSOURCING SOLUTIONS TO GLOBAL PROBLEMS

Anthony D. Williams

Executive Editor
Global Solution Networks

Crowdsourcing can be defined as the outsourcing of tasks traditionally performed by specific individuals to an undefined large group of people or a community (crowd) through an open call for collaboration.

Nearly every global issue today—from air and water quality to the governance of global financial services—could benefit as a result of having a larger crowd of informed individuals helping to generate, vet and implement new solutions.

Consider these examples: the rapidly growing practice of crisis mapping, the use of crowdsourcing to develop global public policy, or epidemiological experimentation with crowdsourced science to improve the detection of public health threats.



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“With a well-designed process, crowdsourcing can help quickly assemble the data, expertise and resources required to perform a task or solve a problem by allowing people and organizations to collaborate freely and openly across disciplinary and geo-graphic boundaries.”

Calling on the Crowd

Crowdsourcing can be defined as the outsourcing of tasks traditionally performed by specific individuals to an undefined large group of people or a community (crowd) through an open call. The public may be invited to develop a new technology, carry out a design task, propose policy solutions, or help capture, systematize or analyze large amounts of data (as in citizen science), for example. With a well-designed process, crowdsourcing can speed the assembly of data, expertise and resources required to perform a task or solve a problem by allowing people and organizations to collaborate freely and openly across disciplinary and geographic boundaries.¹

The paradigmatic example of crowdsourcing is Wikipedia, the world's largest and most dynamic encyclopedia by some distance. With over 4 million English language articles, Wikipedia is more than 30 times the size of its closest commercial analogue, Encyclopedia Britannica (with its total of 120,000 entries). Unlike Britannica, however, Wikipedia does not have a large full time workforce producing its product and it operates on a fraction of the budget. The free online encyclopedia's skeleton staff of 10 full-time employees is augmented by millions of volunteer editors who perform the vast majority of the content creation. In other words, most of Wikipedia's human capital is outside the boundaries of its organization and rather than fiercely protecting its IP, Wikipedia actively encourages users to edit and contribute. The secret to success has been Wikipedia's ability to break down complex tasks into manageable chunks and provide knowledgeable and motivated contributors with a platform to organize into self-policing communities.

Since the success of Wikipedia, crowdsourcing has become increasingly commonplace in business, government and society. Once closed and secretive companies like P&G, for example, now reach beyond their corporate boundaries to co-innovate hundreds of new products with thousands of external partners, shaving over \$1 billion off their annual R&D costs as a result. Meanwhile Amazon, Google and Apple have pioneered highly successful open platform strategies to engender on-the-fly partnerships with very large communities of freelance software coders that have collectively developed hundreds of thousands of applications for their popular mobile technology platforms, giving customers access to staggering levels of continuous innovation.

In government, crowdsourcing has been used successfully to address everything from sourcing a new platform to enable medical researchers to analyze regional disparities in cancer rates to inventing a high-efficiency 10-watt light bulb that emits the same level of light as a 60W incandescent. Even relatively complex and labor intensive tasks have been tackled with amazing speed



and ingenuity—just witness what happened in Estonia in May, 2008. When Estonians regained independence from the former Soviet Union in 1991, they not only acquired new political freedoms, they inherited a mass of rubbish—thousands and thousands of tons of it scattered across illegal dumping sites around the country. When concerned citizens decided that the time had come to clean it up, they turned not to the government, but to tens of thousands of their peers. Using a combination of global positioning systems and Google Maps, two entrepreneurs (Skype guru Ahti Heinla and Microlink and Delfi founder Rainer Nolvak) enlisted volunteers to plot the location of over 10,000 illegal dumpsites, including detailed descriptions and photos. In Phase II, they initiated a mass cleanup all of the illegal sites in one day, with some 50,000 people scouring fields, streets, forests and riverbanks across the country picking up everything from tractor batteries to paint tins.² Much of this junk was ferried to central dumps, often in the vehicles of volunteers.

Crowdsourcing and Global Problem Solving

If 50,000 Estonians can cleanup their country (albeit a relatively small one) in one day, what else could motivated individuals contribute to global problem solving networks and initiatives? Tiina Urm, a spokesperson for the initiative, put it this way: “It is not really about the rubbish. It is about changing people’s mindsets. Next year it might be something else.”³ Indeed, the idea behind crowdsourcing global problem solving is that just about every global issue today—from air and water quality to the governance of global financial services—could benefit as a result of having a larger crowd of informed individuals helping to generate, vet and implement new solutions—solutions that can be used to educate the public, enhance science, inform public policy-making or advance myriad other objectives. One can quite easily imagine countless arenas where, if asked, experts and enthusiasts would contribute:

- Environmental authorities that gather and analyze data about global air quality would benefit from more contributions from local sources and could engage local communities to help them understand the implications of data they are observing.
- A global solution network looking to develop a health diagnostics application that connects health care workers in under-served regions to medical specialists could post a public challenge that invites contributions from a growing international community of social-purpose developers.
- Or the next time a rampant outbreak of pests threatens agricultural production, public officials could enlist



“ Thanks to the advent of the 40-hour workweek, the educated population on the planet has something like a trillion hours a year of free time to spend doing things they care about. ”

farmers to help document and characterize the scope and severity of the damage, just as the American public pitched in to document contaminated areas when the Gulf oil spill devastated the regional marine ecosystem.

Of course, in an age where growing numbers of people report feeling highly time-pressured, it's worth asking whether such global crowdsourcing projects are likely to come to fruition. According to some leading sociologists, there is reason to be optimistic. Although people still cite “time scarcity” as the number one reason for not volunteering or contributing to public good projects, author and New York University professor Clay Shirky argues that our sense of feeling constantly time-pressured is vastly exaggerated. Shirky makes the observation that increases in GDP, educational attainment and lifespan since the Second World War have, in fact, produced a massive abundance of free time.

Thanks to the advent of the 40-hour workweek, the educated population on the planet has something like a trillion hours a year of free time to spend doing things they care about. The problem is that most of our surplus time is absorbed by television. Americans spend some two hundred billion hours watching sitcoms every year and nine billion hours playing solitaire. Yet, according to Shirky's estimates, only a small proportion of the public would need to become more civically engaged to make a big difference. A back of the envelope calculation suggests Wikipedia was built with roughly 1 percent of the man-hours that Americans spend watching TV every year (the rough equivalent 100 million hours of thought). If even a fraction of our surplus time could be directed to the creation of other digital public goods, the connected population could be producing hundreds of Wikipedia-like projects every year or contributing regularly to global problem solving initiatives.

KIVA Lend Zip^{Now} About Teams Updates Login Portfolio

Daisy Himamaylan, Negros Occidental, Philippines Retail | General Store

LOAN OVERVIEW REPAYMENT SCHEDULE LENDER COMMENTS

A loan of \$350 helps Daisy to buy additional household goods like milk, canned goods, soap, egg, etc to sell.

50% raised, \$175 to go

Select amount to lend

\$25 Lend \$25

Repayment Term: 11 months (more info)
 Repayment Schedule: Monthly
 Pre-Disbursed: Jul 22, 2013
 Listed: Aug 21, 2013
 Currency Exchange Loss: Possible
 Default Protection: Not Covered

Daisy is 51 years old and married with eight children, three whom are in school. Daisy works very hard to provide for them.

Your funds will be used to backfill this loan. Repayments will go to you.

A typical borrower profile on crowdfunding platform Kiva.org.⁴

So we have a lot more free time than we think—time that could be redirected to public good projects. But can global problem solving be structured in such a way that the average individual can make a meaningful difference? Again, the answer is affirmative. In fact, the best crowdsourcing projects break large projects or problems down into manageable, “bite-sized” tasks, so even time-pressured people can still contribute. Social innovators Jacob Colker and his business partner Ben Rigby found, for example, that it’s not that people don’t have any time, it’s that they don’t have large chunks available to commit to larger tasks. In addition to watching television, they discovered that Americans spend 4.6 hours a week playing video games, 51 minutes riding public transportation to and from work everyday, 18 minutes in an airport security lane, and half an hour on average standing in line at the post office.⁵ Colker and Rigby reckoned that all of this latent time could be harnessed and given a social purpose. So they designed Sparked, a micro-volunteering platform that allows supporters to use their mobile phone to transform their spare-time into social action. For example, someone with foreign language skills can help translate a non-profit’s website into another language, or someone with a passion for birds can help the Cornell Lab of Ornithology identify species in archived photographs.⁶

In short, the potential scope for crowdsourcing in global problem solving, while not limitless, is very large relative to its deployment today. Todd Park, who recently became Chief Technology Officer at the White House, calls crowdsourcing “a very exciting new tool that governments and other sectors can use to get better results at a lower cost.” “You can greatly broaden and deepen the range of players that can help solve the problem,” he says.⁷ Park did pioneering work in the government crowdsourcing arena during his tenure at the U.S. Department of Health and Human Services and brought his appreciation of prize-based competitions as a method to solve tough problems to the White House. “You draw in unusual suspects along with

The screenshot displays a web-based crowdsourcing map interface. At the top, there are navigation tabs: REPORTS, SUBMIT A REPORT, GET ALERTS, and CONTACT US. Below these, there are sub-tabs for REPORTS, NEWS, PICTURES, VIDEO, and ALL. The main area is a map of Rabat, Morocco, with several red circular markers containing numbers (7, 10, 11, 16, 20, 8) indicating reported issues. A legend on the right side, titled 'CATEGORY FILTER [HIDE]', lists various categories with corresponding colored squares: ALL CATEGORIES (red), MEDICAL ATTENTION (purple), RESCUE NEEDED (blue), CHILDREN (brown), RESOURCES NEEDED (orange), ROAD BLOCKS (grey), and RESOURCES AVAILABLE (green). Below the legend is a 'How to Report' section with the instruction '1. By filling this form'. The map includes a scale bar (1:54K) and a coordinate system (EPSG:900913).

Example of a crowdsourced map.⁸

the more usual suspects. Studies suggest people that win these contests are not the usual suspects, but their aptitude seems obvious in retrospect,” said Park, who added that prizes can often be the initial draw, but often, the challenge of solving a problem keeps developers interested.⁹ There are limitations to the effectiveness of crowdsourcing that will be discussed below, but three examples help illustrate the breadth of possibilities that crowdsourcing platforms open up for global problem solving. The first example is drawn from the rapidly growing field of crisis mapping, where dispersed teams of individuals help collect and analyze information in a crisis situation. The second example showcases the use of crowdsourcing to develop global public policy. A third example is drawn from epidemiology, where researchers are experimenting with crowdsourced science as a way to improve the detection of public health threats (see the table below for a broader list of potential applications).

Models of Crowdsourcing	Potential Applications	Examples
Social Production	Product design and development	<ul style="list-style-type: none"> Linux Wikipedia Open StreetMap
Crowdfunding	<ul style="list-style-type: none"> Fundraising Capital raising 	<ul style="list-style-type: none"> Kickstarter Indiegogo Kiva.org
Microwork	Business process outsourcing	<ul style="list-style-type: none"> Cloudfactory Samasource Mechanical Turk
Crisis Mapping	Emergency response management	<ul style="list-style-type: none"> Ushahidi Standby Taskforce Crisis Mappers
Innovation Challenges	<ul style="list-style-type: none"> Technology invention Problem solving Product design Prototype development 	<ul style="list-style-type: none"> Innocentive X-Prize OpenIDEO
Digital Brainstorming	<ul style="list-style-type: none"> Ideation Forecasting and scenario-planning Strategic planning Policy development 	<ul style="list-style-type: none"> Habitat Jam Our Urban Futures World Congress on Information Technology 2012
Participatory Budgeting	<ul style="list-style-type: none"> Urban planning Strategic planning Resource allocation 	<ul style="list-style-type: none"> Belo Horizonte Hamburg New York City
Citizen Science	<ul style="list-style-type: none"> Data collection Data analysis Pattern recognition 	<ul style="list-style-type: none"> Galaxy Zoo Outbreaks NearMe TuDiabetes.org Seafloor Explorer Marine Debris Tracker

“Okolloh didn't have government grants, official mandates, formal command structures, or elaborate communication protocols; just a loose group of committed individuals under effective grassroots leadership harnessing rudimentary open source technologies to help those in need.”

Crisis Mapping and Crowdsourced Disaster Relief

On January 12, a devastating earthquake struck Haiti, causing a chain of horrific events that few people will soon forget. The magnitude 7.0 earthquake that struck near Port-Au-Prince inflicted horrendous damage, causing more human misery and economic damage than any earthquake on record. In a mere 45 seconds of seismic contortions, an astonishing 15% of the nation's population—1.5 million people—was rendered homeless. Tens of thousands were dead, and hundreds of thousands more were injured. Any semblance of the usual infrastructure emergency crews depend on (roads, hospitals, water, sanitation, electrical power and communication networks) was obliterated. Vast regions of the two-hundred-and-fifty year old city toppled.

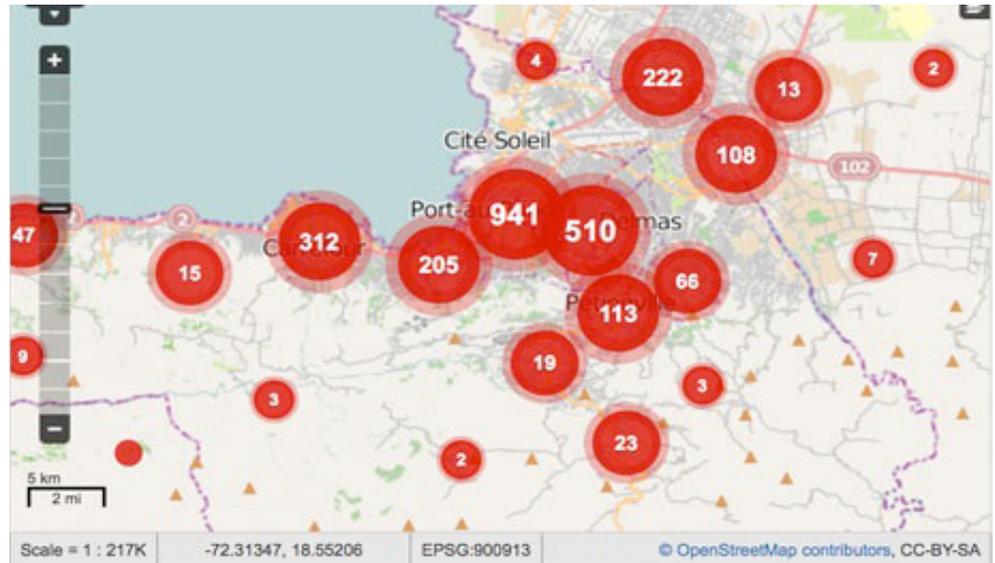
The ruthless and indiscriminate wrath of nature's forces, however, was just a prelude to the real misery. Circumstances on the ground made life astonishingly difficult for first responders. The sea and airports were congested and there were too few trucks to transport supplies and no safe place to store them. No one—not the army, the government, or the aid community—had a clear picture of the full scale of the catastrophe unfolding around them. There was confusion about precisely what supplies had been received, and in which quantities. There was also a lack of coordination among aid agencies and other entities about which people and areas to prioritize and how to overcome this logistical nightmare. This initial lack of coordination, in turn, left Haiti's earthquake victims (already amongst the poorest people in the world) utterly destitute, without food, water or clothing, separated from their loved ones, and many in desperate need of medical attention. Yet, out of the rubble, and in the face of tremendous suffering, came a powerful story of how an ad-hoc team of volunteers from around the world came together to concoct an information management solution that far surpassed anything the official crisis response team had mustered—a team that included the world's largest emergency relief organizations, the US State Department and even the US Army.

Ushahidi and the Global Effort to Crowdfund Assistance for Haiti

At the heart of the volunteer effort was a small Kenyan-born organization called Ushahidi whose crisis mapping site allows users to submit eyewitness accounts or other relevant information in a disaster situation via e-mail, text or Twitter—and then visualize the frequency and distribution of these events on a map. Ory Okolloh, a prominent Kenyan lawyer and blogger, first came up with the idea in 2007 when violence erupted in the aftermath of Kenya's disputed election. After hearing many disturbing reports of rape, looting and murder from friends and family across the country, she suspected that the government and the official news agencies were grossly underreporting the violence. The proof came when her own vivid reporting on her blog Kenyan Pundit triggered a flood of emails and texts from hundreds of Kenyans who had witnessed or experienced violence first hand. The volume of reports soon overwhelmed Okolloh's ability to authenticate and document them using



her blog, so she sketched out the basic parameters of an Internet mapping solution and with the help of some fellow Kenyan technology whizzes, they built the Ushahidi platform over a long weekend.



Crisis mapping Haitian earthquake relief efforts.¹⁰

Within hours of its launch, the site was collecting user-generated cellphone reports of riots, stranded refugees, rapes and deaths and plotting them on a map, using the information supplied by informants. For the first time, interested parties could see at a glance which areas of the country were experiencing trouble. Indeed, the site collected more testimony with greater speed and broader reach than the media or the local officials, except in Ushahidi's case there was a big difference: Okolloh didn't have government grants, official mandates, formal command structures, or elaborate communication protocols—just a loose group of committed individuals under effective grassroots leadership harnessing rudimentary open source technologies to help those in need.

When disaster struck Haiti two years later, Ushahidi's director of crisis mapping, Patrick Meier, sprung into action. Meier had been enjoying a quiet evening watching the news at his home in Boston. It was 7:00pm when he first learned about the earthquake. By 7:20, he'd contacted a colleague in Atlanta. By 7:40, the two were setting up a dedicated site for Haiti on the Ushahidi platform. By 8, they were gathering intelligence from everywhere, in a global effort to crowdsource assistance for Haiti.

Since the majority of incoming text messages were in Creole, they needed a translation service. And since most reports lacked sufficient location details, they needed a way to quickly identify the GPS coordinates so that incidents could be mapped as accurately as possible. So Meier reached out to dozens of Haitian communities for help, including the large diaspora in Boston.



Soon hundreds of volunteers around the world were using Ushahidi-Haiti to translate, categorize and geo-locate urgent life-and-death text messages in real-time. Many of the volunteers spent weeks on their laptops in a dimly-lit school basement in Boston that Meier converted into a makeshift situation room.

Although located some 1,640 miles from the scene, the volunteer crisis mappers used Skype to relay critical information about the location of potential survivors to search and rescue teams on the ground in Port-au-Prince. They responded to requests from the World Food Program and the USS Aircraft Carrier Vinson in the middle of the night. And to better link calls with specific GPS coordinates, they even got direct access to Digital Globe's high-resolution satellite imagery and to the US Army's video footage from military drones. By the time Meier's group had honed their process, text messages were being translated into English and posted online just minutes after they left a mobile phone in Haiti. And as a result of their dedication, many lives were saved. Ushahidi's crisis mappers found themselves center stage in one of the largest relief operations in history.

"If a relief worker from the Red Cross has a field office in the neighborhood of Delmas," says Meier, "they could subscribe to Ushahidi to receive information on all reports originating from their immediate vicinity by specifying a radius."¹¹ Not only were responders able to specify their geographic area of interest, but they could also select the type of alert, say collapsed buildings, medical emergencies, food shortages, or looting. Now, as the focus shifts from crisis relief to rebuilding in the years to come, Meier thinks Ushahidi's crisis mapping tools could just as readily be used by Haitians to hold crisis-relief organizations, private contractors and the local government accountable for higher standards than have been the norm during the many years of failed efforts to lift the impoverished Caribbean nation out of poverty.

A New Paradigm for Disaster Relief and Humanitarian Assistance

The old crisis management paradigm was one-to-many: big institutions and aid workers jet into a crisis and dispense aid with the limited information they have. Most aid organizations don't have good systems for sharing information, and certainly don't like ceding turf or marching to the beat of another organization's drum. The resulting fragmentation leads to poor decision-making, redundancy and confusion, and often to wasted money and wasted opportunities.¹² To make matters worse, the end recipients of disaster relief are almost always treated as helpless victims and passive consumers of other people's charity. This makes for perversely compelling television drama (so-called disaster porn temporarily boosted CNN's ratings by 95%), but it fails miserably in delivering results. Indeed a report produced by the International Federation of Red Cross and Red Crescent Societies following the international community's response to the 2004 Indian Ocean Tsunami highlighted the need for better coordination as well as victim participation in future disaster relief efforts to help ensure the needs and interests of disaster victims are not sidestepped in the rush to implement solutions.¹³



“ To get assistance to people impacted by disasters, FEMA used to rely exclusively on reports from on-the-ground inspectors. Today they use satellite imagery, crowdsourcing and analytics to determine which areas need help and to mobilize resources more quickly. ”



Mapping the Gulf oil spill in Louisiana using the Ushahidi platform.¹⁴

The emerging paradigm for humanitarian assistance turns much of the sector's conventional wisdom upside down. Rather than sit idly waiting for help, victims supply on-the-ground data using cellphones or whatever communications channels are available to them. Rather than simply donate money, a self-organized network of volunteers triages this data, translating and authenticating text messages and plotting incidents on interactive mapping displays that help aid workers target their response. And rather than just forge ahead with narrow institutional priorities, new communication channels like Ushahidi create the potential for the whole emergency relief ecosystem to operate like a coherent entity.

Of course, many things could go wrong with this distributed model. People could get the address wrong or exaggerate their situation. But as data accumulates, crisis maps can quickly reveal the emerging patterns of reality in an emergency situation: How many miles inland did the tsunami kill? Which roadways are passable and where are the closest temporary emergency wards? Are the incidents of violence and looting broadly dispersed or concentrated around certain neighborhoods? As Kate Chapman of the Humanitarian OpenStreetMap team put it: "The reality is that in a disaster cycle, everyone has a piece of information, everyone has a piece of that picture. The more that people are able to share information data across ecosystems, and the more information that people have to utilize, then we'll really see disaster response...be more effective."¹⁵

Yet, the challenges that crowdmapping presents for humanitarian assistance organizations and networks are real, and much subsequent reflection since the Haitian earthquake has unearthed some important lessons and recommendations. As the Harvard Humanitarian Initiative notes in its *Disaster 2.0* report, there are still considerable cultural, procedural and

“While a global parliamentary assembly is unlikely, and perhaps undesirable, crowdsourced policy-making by GSNs and international organizations is a logical first step towards greater inclusion, accountability and legitimacy in global decision making.”

technical gaps between traditional disaster response organizations with their “command-and-control” orientation, and the loosely-structured volunteer and technical communities, which thrive on innovation and spontaneity.¹⁶ The humanitarian system, for example, has few protocols, procedures, or policies governing the use of information generated by citizens through social media, and the voluntary communities are still learning how best to support to the work of information managers in the humanitarian system. To date, these two groups have no mechanisms for coordinating collaboration and no formal channels to engage in dialogue about the underlying problems of information management. Among other things, the Harvard Humanitarian Initiative recommends:

- the establishment of a neutral forum to surface areas of agreement and conflict between the international humanitarian system and the crisis mapping community
- an innovation space where new tools and practices can be explored as experiments
- a research and training consortium to evaluate the work in the field and to train humanitarians and volunteer communities alike in the best practices for information management
- a clear operational interface that outlines ways of collaborating before and during emergencies, with agreed procedures for communication, shared standards for data exchange and an understanding of roles, priorities and capabilities.¹⁷

The Evolving Promise of Crowdmapping

Despite the challenges, the overriding promise of crowdmapping is clear: given an open platform and a complement of simple tools, ordinary people can create effective new information services that are speedier and more resilient than traditional bureaucratic channels. Indeed, what is remarkable is that the Ushahidi-Haiti project might have taken a government agency with loads of money a year or more to execute. Yet, thanks to social innovators like Okolloh and Meier, the crisis mapping community rallied to pull it together in a matter of days with absolutely no cost to the taxpayer.

Perhaps most encouraging, however, is that major disaster relief agencies and international organizations—the ones with serious manpower and significant budgets—have begun to incorporate crowdsourcing and crisis mapping platforms into their strategies. In the recent Hurricane Sandy and Oklahoma tornado response, for example, FEMA (the US-based Federal Emergency Management Agency) harnessed technology and crowdsourcing in all kinds of ways to deliver better results. To get assistance to people impacted by disasters, FEMA used to rely exclusively on reports from ground inspectors. Today they use satellite imagery, crowdsourcing and analytics to determine which areas need help and to mobilize resources more quickly. Mike Hall, FEMA’s federal coordinating officer in New Jersey, described the volunteer efforts to review incoming imagery and speed damage assessments as



“unprecedented.” According to Hall, some 4,000 online volunteers helped categorize images and the results provided a comprehensive view of the impacted areas and enabled responders to prioritize assistance in the areas where it was needed most.¹⁸ A similar crowdsourcing effort helped federal authorities pinpoint locations to send their gasoline fueling trucks in the midst of widespread gas shortages in New Jersey.¹⁹

Meanwhile, the Ushahidi platform itself continues to evolve as spin-off projects yield powerful new capabilities. The crisis in Haiti, for example, highlighted the need for a tool that could help crisis responders understand and act upon the massive waves of crisis data that tend to overwhelm operations in the first 24 hours of a disaster. Traditional information triage requires a human to read each report or document and distill the important bits for others in their organization or network. It is a venerable method, but it’s also slow and not easily scalable to handling massive increases in data flows without also increasing the number of humans reading documents. So Ushahidi developed SwiftRiver, a suite of intelligence and data gathering applications that can pull in real-time data from Twitter, SMS, email and RSS feeds and auto-categorize and classify it using semantic analysis. Such tools can dramatically reduce the time required to triage information by using computers rather than people to identify important trends and relationships that may otherwise appear unrelated.²⁰

In 2013, the Ushahidi team responded to one of the most fundamental information management problems facing emergency responders in a disaster: the need for reliable connections to the Internet in unpredictable environments. Spotty wireless connections, intermittent power, or devices that can’t share connections can all undermine the solutions that Ushahidi has worked hard to develop. So its engineers branched out into hardware with BRCK—a so-called “back-up generator for the Internet.” The device—which resembles a cast iron brick—is physically robust enough to withstand fieldwork in the most rugged environments. It can connect to multiple networks, switching seamlessly between Ethernet, Wifi, and 3G or 4G mobile phone networks as needed. It provides a hub for all local devices, allowing large teams to share a single connection point. And it stores enough backup power to survive a blackout, with 8 hours of battery life.²¹



Ushahidi’s BRCK (Back-up generator for the Internet) at work²²



“Habitat Jam broke down the barriers of language, literacy, disability, poverty, war and the digital divide to enable over 39,000 people from 158 countries to begin a conversation that some say will change the world.”

As Ushahidi’s products continue to evolve and improve, so do the uses, cases and applications of its technologies. To date, the versatile platform has been used in Africa to report medicine shortages; in Gaza to track incidents of violence; in Macedonia to track reports of corruption; and in Armenia, India and Mexico to monitor elections. The Washington Post even partnered with Ushahidi in 2010 to map road blockages and the location of available snow blowers during the infamous Snowmageddon, DC’s largest snowfall in nearly a century.²³

With every new application, Ushahidi is quietly empowering millions of ordinary individuals to play a larger role in everything from democratic decision-making to crisis management to protecting public health. In doing so, Ushahidi highlights a profound contrast between a set of global problem solving institutions that revolve around hierarchical organizational designs and a new set of bottom-up institutions that are being built on principles such as openness, collaboration and the sharing of data and intellectual property.

Crowdsourced Policy-Making and Digital Deliberation

In a representative democracy, the public participates in governance primarily through voting. Rarely do elected officials seek the expertise of private citizens in making specific decisions about policy. Yet officials in government are not always in possession of all the information necessary to make a decision in the public interest, nor do they always possess the time or the know-how to evaluate the information they have. Crowdsourcing platforms create new opportunities for participation by making it possible to organize the solicitation of know-how and expertise from the public. Indeed, there is increasingly a case to be made that global public policy dialogues should be held internationally, allowing ordinary citizens an opportunity to feed into global decision-making.

Consider the trends: Global economic interdependence and transborder issues demanding international responses. Connected citizens, awash in information and empowered to express their voices. Virtual communities linking cultural and ethnic diasporas around the globe. And a broad range of new global institutions and networks created to match the scope of global economic, environmental and security challenges. It only makes sense that some form of democracy should be extended to the international level. While a global parliamentary assembly is unlikely, and perhaps undesirable, crowdsourced policy-making by GSNs and international organizations is a logical first step towards greater inclusion, accountability and legitimacy in global decision-making.



“Imagine a scenario planning exercise where thousands of connected participants could tap into vast pools of shared data and adjust decision variables on the fly to see how their decisions might impact real people in the future.”

The Global Agora

Online communities have already demonstrated their potential to leverage considerable human knowledge and expertise and rapidly build their capacity. At the same time it is now recognized that online collaborations have the potential to trigger and shape significant changes in the way future societies will function. Extrapolation of the present exponential growth leads to scenarios where very large percentages of populations could, if equipped with right tools, simultaneously voice opinions and views on major and minor societal challenges, and thereby herald the transition to much more inclusive and participative global solution networks.

By 2020 there will no longer be barriers to citizen and business participation in decision-making at all levels. Advanced tools—possibly building on gaming and augmented reality technologies—will enable citizens to track the totality of decision-making processes and see how their contributions have been (or are being) taken into account. Current linguistic and cultural barriers will have been largely overcome through use of semantic-based cooperation platforms. Opinion mining, visualization and modeling tools will allow stakeholder to forecast virtual reality based outcomes and scenarios that will help to shape, guide and form public opinion. And so long as the processes and tools to establish trust and authenticity are robust enough to prevent manipulation, the outcomes of such consultative processes should be faster, more legitimate and more efficient in terms of revising policy and making decisions.

Of course, technology alone is not enough; governments, international organizations and GSNs must begin to evolve new participatory practices that exploit the available tools. Present government processes (local, regional, national and international) develop laws and regulations, interpret and define societal norms and deliver societal support services. Their legitimacy is derived through democratic processes combined with a requirement of transparency and accountability. In a world that is increasingly using digital communication and borderless interaction, traditional roles and responsibilities of public administrations will be subject to considerable change and classical boundaries between citizens and their governments are blurring. The balance of power between governments, societal actors and the population will have to adapt to these challenging new possibilities. So too will the governance models, process flows, and analytical tools with which to properly understand, interpret, visualize and harness the forces that could be unleashed by a more participatory and interactive model of global decision-making.

HabitatJam: Digital Brainstorming for the World Urban Forum

One model of crowdsourced policymaking that has proven effective in the international arena is the digital brainstorm. Indeed, its potential was vividly demonstrated in 2005, when the Canadian Government, through its Minister of Labour and Housing, Joe Fontana, decided to use the global reach of the Internet to help address the world’s most challenging urban issues in a democratic manner. Fontana envisioned a novel democratic experiment—one that could take the conversation about urban sustainability



issues to the streets on a global scale. In partnership with IBM and the World Urban Forum Secretariat, he conceived an audacious plan to bring thousands of participants from government, business, academia and civil society together for a 72-hour facilitated online discussion where they could strategize around how to provide access to clean water and sanitation, boost environmental sustainability, and improve local governance in the world's rapidly growing metropolitan regions.

The engagement process, a digital brainstorm, was modeled after an event IBM first held in 2001, called an Innovation Jam, where IBM brought together its employees worldwide to explore solutions to global problems. In 2006, the same event was even more successful, bringing together one hundred and fifty thousand employees and dozens of thought leaders online to brainstorm new areas of opportunity for IBM in sectors such as health care, transportation and energy. CEO Sam Palmisano believed so strongly in the concept that he committed up to \$100 million to develop the ideas with the most social and economic potential.²⁴

The World Urban Forum Secretariat didn't have that kind of money to throw at urban sustainability initiatives, but through the courage and support of hundreds of organizations and individuals from around the world, the Habitat Jam broke down the barriers of language, literacy, disability, poverty, war and the digital divide to enable over 39,000 people from 158 countries to begin a conversation that some say will change the world.²⁵

The diversity of the 39,000 was impressive. Slum-dwellers participated alongside government ministers, who participated alongside school children who participated alongside leading academics. The conversation ranged across issues of transportation, clean water, governance, poverty and other issues of importance to people living in cities—especially those who are poor.

As perhaps one of the largest public consultation exercises ever attempted, the event proved that it is possible to reach out to thousands to discuss and deliberate about ideas that might be the source of new and more effective policies and services. Indeed, these loosely distributed networks can coalesce to provide focused advice from those most affected by an issue, or those in the best position to take action.

According to Fontana, "It was an unbelievable learning experience...This was not a policy conference anymore. It was a gathering of practitioners from civil society and the private sector exploring these questions: What things have worked? What have we learned? What mistakes have we made? How do we do things better?"²⁶ The Habitat Jam was successful in leveraging global networks to bring forward the experience and voices of people who would have never been able to attend the World Urban Forum. Their 'actionable ideas' were the starting point for the conference, designed to build networks that would carry their ideas into implementation through improved policies and services—at a global, national, and community level. What is remarkable is the number of the actionable ideas from the Jam. More than 4,000 pages of discussion were captured; 600 ideas generated; and 70



actionable ideas researched and summarized in a workbook for the meeting held in Vancouver in June 2006.²⁷

Apart from these impressive results, there are other less obvious benefits of large-scale online consultations. First and foremost, the broader participation enabled through digital brainstorming leads to better ideas and perhaps a greater diversity of ideas as well. Greater inclusion in the decision-making process, in turn, generates a greater sense of ownership when it comes to implementing the results. The digital brainstorming process facilitates “organizational memory,” leaving a permanent, searchable record of what might otherwise been water cooler conversations and thus provides a foundation for subsequent discussions. It also dispenses with the old model of atomized input and central processing—think “suggestion box”—in favor of a more collaborative model with tools that enable the creation, learning, shaping, sharing and tracking of group knowledge as the process unfolds. In other words, brainstorming is conversations that open up a space for deliberation, analysis and perhaps even compromise among multiple stakeholders. And though existing brainstorming platforms don't yet offer this, future iterations could include advanced tools that enable citizens to track most decision-making processes and see how their contributions have been (or are being) taken into account.

Collaborative Forecasting with the Our Urban Future Project

Habitat Jam emphasized a mix of online discussion and face-to-face consultation, and one of its strengths lay in the ability of the network to provide disenfranchised communities with an opportunity to participate in a conversation in which they would otherwise have been marginalized. However, the policy development tools developed since then allow for a much richer dialogue where future scenarios can be visualized and policy options not only discussed, but also evaluated using real data.

Imagine a scenario-planning exercise where thousands of connected participants could tap into vast pools of shared data and adjust decision variables on the fly to see how their decisions might impact real people in the future. Stakeholders could forecast, for example, whether investments in primary education for girls will yield better poverty alleviation outcomes than, say, investments in reducing the digital divide. Or, in the efforts to tackle climate change, imagine if scientists, policy-makers, environmentalists, investors and ordinary citizens could access comparable CO₂ emission data for all industrial facilities and other human activities such as logging, fishing or mining. And not only access it, but measure, in precise detail, the impact of those activities on our climate in the same way companies apply financial metrics to their investment decisions to understand the bottom line impact. Such possibilities are no longer as far-fetched as they sound.

In 2013, for example, the Evergreen Foundation teamed up with the World Bank, the World Economic Forum, UNEP and hundreds of partners worldwide to create a global policy network called the Our Urban Future project that leverages a unique form of collaborative forecasting and policy



design. One particularly innovative element of the project includes the use of a dynamic forecasting engine built on an open-platform model that permits users to adjust key variables—for example, the rate of urbanization in Southeast Asia, or investments in transportation infrastructure in Central America—in order to examine the impacts of alternative urban investment scenarios on urbanization challenges. Participants will have access to data on historical patterns, trends and planned expenditures in six key sectors, including transportation, energy, water, waste, buildings and technology. The model will permit a number of “straight-line” forecasts over a 50-year time horizon, allowing stakeholder groups and individual citizens to evaluate their preferred urban investment strategies against various political, social, financial and physical design considerations—a process normally reserved for expert policy modelers.



The Participatory Budgeting Project²⁸

As is true of Habitat Jam, online tools are only part of the Our Urban Futures exercise. The scenario-planning phase will be complemented by a broad public outreach program that includes extensive crowdsourcing and civic engagement. Additional face-to-face scenario-planning exercises will be undertaken in Toronto, New York, London, Singapore, Delhi, Nairobi and Shanghai in order to harvest local innovation and catalyze communities around the goal of reimagining (and rebuilding) cities for sustainability. Participants will form into multi-stakeholder teams representing municipalities, industry, non-profits, academia and government. Their job will be to generate visions for the future—visions that are regionally specific, contextual, granular and connected to local conditions. The expectation is that the shared pool of local visions will help surface larger patterns that will be useful in building a global vision for urban infrastructure. And finally, to make all of this real, a network of “change-labs” will be set up where ideas can be piloted locally, further refined and then propagated internationally

“ *Broad participation in citizen science projects like Galaxy Zoo helps boost the public’s general understanding of science, a nice side effect at a time when some degree of scientific literacy is required just to understand, let alone solve, some of our biggest public policy issues.* ”

if successful. All considered, these varied ingredients, strategies and tools make the Our Urban Future project one of the most global, collaborative and comprehensive efforts to forecast the future of urbanization and design effective policies in collaboration with thousands of individuals.

Participatory Budgeting: Designing a Bottom-Up Budget

Digital brainstorming and participatory scenario-planning are great for building networks, forecasting the future and generating proposals for action. Tools such as participatory budgeting, on the other hand, are well-suited to enabling citizens to play a meaningful role in shaping local policies and decisions that affect them directly. Participatory budgeting is a process of democratic deliberation and decision-making in which ordinary people decide how to allocate part of a municipal or public budget. Participatory budgeting allows citizens to identify, discuss, and prioritize public spending projects, and gives them the power to make real decisions about how money is spent. The process generally involves several basic steps:

1. Community members identify spending priorities and select budget delegates
2. Budget delegates develop specific spending proposals, with help from experts
3. Community members vote on which proposals to fund, and
4. The city or institution implements the top proposals.

When participatory budgeting is taken seriously and based on mutual trust, governments and citizens can benefit equally. In some cases participatory budgeting even raises people’s willingness to pay taxes. In fact, citizens have already proven themselves able to make measured, well-reasoned decisions about budgetary issues in cities around the world. The Brazilian city of Belo Horizonte, for example, has been doing participatory budgeting since 1993 and today allocates some \$43 million for public works projects that are selected by citizens in nine individual districts.²⁹ In Zeguo Township, China, citizens have been convened through statistically random sampling to establish spending priorities for road, building and construction projects. The German city of Hamburg is perhaps the most technically sophisticated: Its participatory budgeting exercises conducted in 2006 and 2009 featured an online budget app with sliders that citizens could manipulate up or down to increase or decrease the level of funding for 22 budget items. The site attracted 50,000 visitors who generated over 2,100 draft citizen budgets, with a selection published in local newspapers and used as a basis for discussion in the local parliament.³⁰

If asking citizens for ideas on how to allocate spending or improve service quality has already proven effective at the local level, there is no reason why such practices could not be extended to the international arena. Citizens in developing nations could have a say on how development financing from the World Bank is spent in their local communities, for example. Or NGOs could use participatory budgeting to allow recipient communities to help prioritize their overseas aid initiatives.



The Imperative for Participatory Decision-Making

Regardless of the engagement tools deployed, it has become clear that NGOs, governments, companies and international organization can no longer act as isolated decision-making units in a world where complex transboundary issues will overwhelm their capacity to develop meaningful responses in a timely manner. Participating in global solution networks will help equip all stakeholders with the external ideas, skills and resources they will need to coordinate their efforts across jurisdictions and sectors. And the expanding toolkit of engagement tools means that a lack of technology is no longer a valid excuse to exclude relevant stakeholders from the conversation.

Citizen Science and Global Problem Solving

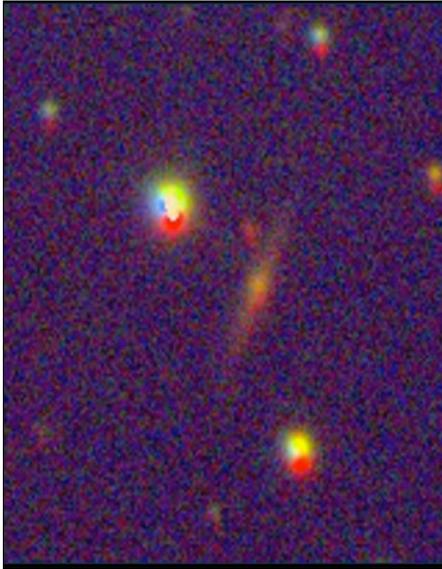
Another fascinating and powerful addition to the global problem solving toolkit is the growing practice of citizen science, which is essentially scientific research conducted, in whole or in part, by amateur or nonprofessional scientists. The involvement of citizens in science arguably traces its roots to the discipline of ornithology (the study of birds), where researchers have long benefitted from the work of an international network of birdwatchers who publicly share their findings, (the Audubon Society's famous "Christmas Bird Count," for example, was first undertaken in 1900). Over the years, the observations reported by amateur birdwatchers—from backyards to city streets to remote forests—has vastly increased the data available to researchers and helped the ornithology community better understand birds and their habits.

With the advent of the Internet, the phenomenon of citizen science has taken off. Today citizen scientists are engaged in just about every discipline. Some are helping to classify galaxies and identifying new planets. Others are using wireless air and water quality sensors to characterize environmental conditions in their neighborhoods. An umbrella organization called the Citizen Science Alliance is currently nurturing a very broad portfolio of citizen science projects in disciplines ranging from data engineering and oceanography to astronomy and archaeology. And in some cases, citizen science projects have spun off powerful new problem-solving networks.

Mapping the Universe

One of the most successful citizen science efforts to date is called Galaxy Zoo, a project that attracted 275,000 amateur astronomers in a massive crowdsourced effort to map the universe. The project solves one of basic problem facing astronomers: increasingly powerful telescopes have captured far more images of various galaxies scattered across the universe than trained astronomers can possibly classify. Even in the age of computer-aided science, each image needs to be closely scrutinized by hand to ensure the classifications are accurate. According to Kevin Schawinski, one of the projects founders, even the smartest and most powerful computers are prone to making mistakes that would never trip up a human. But it turns





A typical galaxy image for classification on Galaxy Zoo.³¹

out that an untrained eye can perform accurate classifications with some basic guidance, which prompted Schawinski and his colleagues to cook up a crowdsourcing scheme whereby an army of armchair astronomers would help them sort through the millions of galactic images they had stored up in their databases.

As a science project, Galaxy Zoo was tremendously successful. Not only did the citizen scientists perform 75 million classifications of one million different images of the universe, the project has resulted in real scientific discoveries, with several papers already published using the data and a dozen or so more on the way. The Galaxy Zoo team—which includes astronomers from Yale and Johns Hopkins University in the United States, and the University of Oxford and the University of Portsmouth in the United Kingdom—has often been surprised by the results. Bill Keel, an astronomy professor at the University of Alabama who studies overlapping galaxies, decided to ask Galaxy Zoo users to contact him if they came across an example of this rare phenomenon. Throughout his career, Keel had studied the dozen or so overlapping galaxies then known to astronomers. Within a day of posting his question on the Galaxy Zoo forum, he had more than 100 responses from users who had indeed found such objects. Today, thousands have been identified.

The Galaxy Zoo project has generated other unexpected benefits. The increasingly tight-knit community's members range from individuals with no astronomy background, to schoolteachers and students, to parents who participate with their children as a sort of family activity. They share experiences, solve problems together and help educate new members as they join. Some community members have contributed improved user interface solutions, while other Zooites arrange regular meet-ups in places like New York, London and Amsterdam.

One could argue that citizen science has become a genuine social movement, complete with a shared sense of identity, shared goals and accomplishments, and a social fabric that binds them. On top of all that, broad participation in projects like Galaxy Zoo helps boost the public's general understanding of science, a nice side effect at a time when some degree of scientific literacy is required just to understand, let alone solve, some of our biggest public policy issues.

Citizen Epidemiologists and Public Health Surveillance

When it comes to using citizen science to aide global problem solving the possibilities are vast. Notes from Nature asks for citizen's help with the mammoth task of transcribing several centuries of specimen records taken before research data was stored digitally so it can be used to advance research related to species extinction, ecosystem changes, and environmental health. A Marine Debris Tracker developed by NOAA's Marine Debris division allows mobile phones users to report sightings of discarded metal, fishing gear, plastic, glass and other waste that can both sully a beach and pose a health threat to oceanic inhabitants.³² The Seafloor Explorer



The TuDiabetes online community³⁴

enlists citizen scientists to troll through 40 million undersea images to indicate whether they see fish, scallops and other organisms in each image, provide basic measurements and describe whether the seafloor is sand or gravel, and whether they see boulders and other interesting objects in the frame.³³ The examples go on and on.

In one of the most advanced applications in a global problem-solving field, epidemiologists are utilizing citizen science to bolster disease prevention and enhance public health surveillance. Two years ago, a team led by John Brownstein of the Computational Epidemiology Group (CEG) in the Children's Hospital Informatics Program (CHIP) released an iPhone app called Outbreaks Near Me. In addition to letting users track infectious disease outbreaks on the ground in real time, it enables users to submit an outbreak report. Outbreaks Near Me integrates with HealthMap, a CEG-developed website that displays a unified and comprehensive view of the current global state of infectious diseases based on data from a range of sources, including on-the-ground reports. His team has since launched a second app, MedWatcher, that allows users to get drug safety updates and report information about drug side effects on an international level.

More recently, CHIP's Intelligent Health Laboratory (IHL) partnered with TuDiabetes.org, a health social network focused on diabetes, to launch a data-donation drive encouraging community members to share their hemoglobin A1c status, a health metric used to measure diabetes control over a prolonged period of time. The TuDiabetes community responded enthusiastically: Within three months, 17 percent of active members shared at least one A1c value using TuAnalyze, an application developed by IHL

“ When the EPA announced that it would make small grants available to communities interested in monitoring pollution in their local environments, the response was so overwhelming that only 7% of applicants could be funded. ”

and launched on theTuDiabetes site. The application allowed users to share their health data anonymously or publicly. The submitted data were aggregated and displayed on state or country level maps in near real-time. More than 30 percent of participants chose to share their personal A1c data publicly on their community profile. Importantly, the average A1c values gathered through TuAnalyze nicely matched those reported in the Centers for Disease Control’s most recent National Health and Nutrition Examination Survey (NHANES).

The environmental exposure assessment community is also embracing techniques to involve the public in collecting physical environmental samples. For example, at the October 2011 meeting of the International Society of Exposure Science, attendees are asked to collect samples of house dust and soil to bring to the meeting, which will inform a large-scale analysis of geographic patterns of metal exposures.³⁵ While participants in the study would clearly have greater expertise and interest in the topic than the general public, similar approaches have been used successfully for less labor-intensive exposure characterization, including providing hair samples to researchers for mercury characterization. Environmental agencies like the EPA have since begun to systematically evaluate the environmental media and biomarker measures that might be amenable to broad-based crowdsourcing efforts at the national level, and there is no reason why strategies could not be developed to enable both data collection and participant engagement at the global level.

Bolstering Science for Global Public Policy

Citizen science projects offer a number of advantages to global solution networks, particularly those focused on public policy issues that intersect with cutting-edge science. Citizen scientists have contributed vital data in domains where data is scarce and/or prohibitively expensive to acquire. They have provided the manpower to digitize, analyze and classify data in instances where computer algorithms are inadequate, advancing projects by years and even decades in some cases. They have generated novel discoveries, such as when a Dutch high school teacher identified a novel celestial entity lurking in a random image of the universe. And they contribute to broader scientific literacy and lend a sense of civic purpose to the pursuit of scientific knowledge.

At the same time, citizen science initiatives raise a number of challenging issues, including maintaining quality assurance and ensuring unbiased information gathering. Some elements of the scientific community may always doubt the capacity of citizens to engage meaningfully in science without adequate training in scientific methods. Yet, the examples above suggest that appropriately structured citizen engagement in science can bolster scientific progress in global public policy domains and provide novel data to global solution networks that are active on issues ranging from air quality to infectious disease.

Judging by the sheer number of crowdsourcing projects popping up, many scientists are keen to increase the involvement of communities and other



stakeholders in their research. Galaxy Zoo's Kevin Schawinski calls citizen science "a powerful multiplier," and claims it "makes research possible that just wasn't possible before."³⁶ A database compiled by *Scientific American* lists over 100 active projects across virtually all fields of scientific endeavor, bolstering Schawinski's claim.³⁷

Nor is there any shortage of desire on the part of citizens and communities to participate in scientific research. When the EPA announced that it would make small grants available to communities interested in monitoring pollution in their local environments, the response was so overwhelming that only 7% of applicants could be funded. The implication is that the provision of relatively small resources for citizen science by global solution networks could engage communities and provide enhanced data streams, especially if the results are communicated back to the community.

Harnessing the Power of the Crowd

Crowdsourcing is not so much a technology, as a rather unique problem-solving approach enabled by networked technology. Its potential applications are very broad—ranging from citizen science to crowdfunding to digital policymaking to crisis mapping and much more. Indeed, the examples provided above only highlight a fraction of the capabilities that could be unleashed when global solution networks use crowdsourcing to tap into a broader talent pool. What follows is a brief discussion of some of the opportunities and challenges that global solution networks will face in harnessing crowdsourcing, with broad implications for network leaders and a specific set of recommendations regarding the use of crowdsourcing in policy development.

Implications for Network Leaders

While crowdsourcing presents an opportunity for global solution networks, there are some important questions to resolve first. What types of problems, tasks or endeavors are amenable crowdsourcing? How should networks design and structure crowdsourcing initiatives to increase the chances of success? What motives drive people to participate? And, what types of incentives will help increase both the quality and number of participants?

Crowdsourcing is ideal for identifying small and highly specialized communities of uniquely qualified minds. Crowdsourced problem solving does not depend on widespread or uniform participation. For example, a global solution network focused on alternative transportation solutions does



not need 100,000 people to work on the advanced batteries for electronic cars. It just needs access to few hundred or perhaps a few thousand of the world's most qualified researchers and innovators. While some issues attract a huge number of people, global solution networks make obscure but important decisions every day that could be better if they used technology to open participation and oversight to a few dozen experts and enthusiasts—the five or ten or hundred people who know the issue best or who are passionate about getting involved in a particular way. Crowdsourcing simply means making it easier for such people to find the areas where they want to work and contribute and giving the public the tools and the process to make participation meaningful and practicable so as to attract high-quality participation and eliminate incompetence.

Crowdsourcing is not well-suited to long-term complex problems that are hard to break down into discrete tasks. You can't, for example, crowdsource the ultimate solution to poverty. But you can crowdsource the funding required to back small community economic development projects on Kiva.org. Or you can crowdsource a better visual interface for displaying the World Bank's development indicators—just as the World Bank did with its “Apps for Development” contest in 2011. In other words, crowdsourcing works well for bounded problems—i.e., problems that have easily definable parameters and outcomes. If the precise solution you are seeking can't be articulately and succinctly described, then it probably isn't a good candidate for crowdsourcing.

Crowdsourcing projects are driven by diverse motivations. The answer to what motivates people to participate in crowdsourcing projects (whether citizen science, policymaking or crisis mapping) is ultimately as complex as human nature itself. Some do it for fun or philosophical reasons, and others do it for profit. Some participate to fulfill unmet needs, and still others seek the reputational benefits that can translate into better career prospects. As diverse as they are, the motivations essentially boil down to a mix of intrinsic and extrinsic rewards. Most examples of mass collaboration for the public good are fueled by the personal utility that individuals derive from their participation in the creative process, including intrinsic rewards like the satisfaction of having solved a tough problem or the desire to meet unique needs that the marketplace has not addressed. In fact, the importance of intrinsic rewards is backed up by research. In a survey of nearly 700 open source developers conducted by the Boston Consulting Group, programmers reported that intrinsic rewards such as creativity and autonomy out-weighed extrinsic rewards such as income, career advancement and skills development.

Crowdsourcing requires incentives—even for public good projects. Relying on altruism by itself is not necessarily sufficient to motivate contributions to the public good. Global solution networks that pursue crowdsourcing still need to pay careful attention to the explicit and implicit incentive systems they put in place. In most innovation or app development contests, for example, only the winner receives recognition or compensation, which means many participants who devote time and intellectual effort to contributing ideas may get little reward for their hard work. Finding ways to recognize



and reward all contributors creates good will and can help foster the desire to contribute to future projects. For example, the Mozilla Foundation—backers of Firefox, the open source web browser—placed a two-page ad in the New York Times thanking the thousands of individuals that have contributed to the Firefox development over the years. Mozilla also holds regular contributor appreciation days in cities around the world and maintains a running list of all contributors on its website.

Implications for Policy Networks

Engaging regular people and experts using crowdsourcing seems a straightforward way to both promote democratic engagement in global solution networks and draw in expertise and new ideas to public policy. But there are some unique challenges in applying crowdsourcing to policy development. On one hand, the evidence suggests that creating an open, nonhierarchical space for ideas focused on change taps incredible energy. But it also creates a major commitment to action when thousands of involved minds come together to set an agenda. While some stakeholders may embrace this new culture of deliberation, other may express reticence. For example, governments tend to emphasize hierarchy, debate behind closed doors, and a culture that is often skeptical of new ideas. Global problem solvers must work to reconcile these diverse organizational cultures in order to fully realize the potential for crowdsourcing to add ingenuity, legitimacy and momentum to the work of public policy. The following are some key implications for policymakers and other participants in policy networks.

Crowdsourcing policy is not about gathering opinions—it's about assembling insight and capability. When it comes to crowdsourced policymaking and digital engagement, the idea is not merely for governments, international organizations or GSNs to understand what citizens think should happen; public opinion polls can do that. But what polls don't capture is the wisdom and insight that a nation can collectively offer through online brainstorming and discussion. Social networks and technologies are making the process of engaging citizens in: easier and less costly than ever. As some of the earlier examples illustrate, the possibilities are wide-ranging. International gatherings and forums can post background information on the Web and use online video conferencing to bring in expert testimony. Web-enabled forums can enable discussion and debate amongst hundreds, thousands, and even millions of geographically-dispersed participants. Wikis provide a platform for collaborative editing of policy documents, while social networking technologies can connect citizens and organizations with common goals and interests. The promise is that digital engagement technologies will support global decision-making processes and GSNs that integrate citizen engagement, policy development and implementation into a seamless and flexible practice of continuous engagement, improvement and innovation.



Crowdsourced policymaking needn't place undue strain on public officials or GSN leaders. With a collaborative process, some of the burden of collecting, sorting, analyzing and drafting shifts to the public, leaving public officials in a position to steer and referee the process. An opportunity space opens up for deliberation, reflection and perhaps even compromise among multiple stakeholders. Here's how New York University professor and GovLab founder Beth Noveck puts it: "In a collaborative government, public participation is not pro forma. Though the recommendations made by private citizens are not binding, they are taken as serious contributions to the decision-making process. At the same time, collaboration assumes that stakeholders are qualified to make useful contributions to the subject- or industry-specific work of the agency. As such, a government agency that solicits public feedback employs a system to evaluate the input of the self-selecting private citizen. Only it is not the government agency that initially evaluates public feedback. Initially, ratings and recommendations remain in the hands of private citizens. Their recommendations are vetted by groups ancillary to the government agency. These groups comprise the very individuals who have volunteered their expertise in the first place. This alleviates some of the burden that participation outside of organizational boundaries creates for government officials."

Inclusive processes are key to fostering legitimacy. Finding ways to foster genuine inclusiveness—regardless of social, cultural, religious or economic barriers—is one of the key challenges for multi-stakeholder dialogues and policy networks. For example, Habitat Jam was designed to provide a voice to those who were living in the conditions up for discussion at the World Urban Forum. Many of them—especially rural villagers and slum dwellers—have little to no access to the Internet, except through rudimentary mobile phones that don't support advanced applications. The digital divide was thus a very real barrier to inclusiveness, and threatened the legitimacy of the project. To solve the problem, more than 400 civil society organizations were enlisted to connect with the communities that deserved to be heard. Internet kiosks were set up in slums and villages, where people could come to have their suggestions transcribed onto the Jam website. Public meetings were held to discuss the issues. CyberCafes became hubs for community input into the process. One deaf man in Kenya even brought his own translator to ensure that his ideas could connect with global leaders.

Governments and GSN leaders must be prepared to cede some control. Many politicians and international bureaucrats would genuinely like to reduce the democratic deficit at the international level and strengthen representative processes. The reality is that getting to genuine citizen engagement is hard—it entails a truly massive shift in the culture of international organizations and networks and the apparatus of decision-making. Giles Gherson, senior civil servant for the Government of Ontario speaks for all level of government, from local to global, when he says, "If we're going to be getting into the wiki world and engaging citizens and having real authentic conversations with them, then it's probably going to have to be a very different culture. We're going to have to cede a lot of control over that conversation."³⁸ Indeed, the promise of participatory policy-making is that of a continuous circle of policy innovation and adaptation that integrates the



knowledge and experience of a broad range of stakeholders in government, business, and civil society. In the internet networked policy networks of the future, decision-making will be the product of consultation and collaboration within networks that assemble around relevant political issues. Governments will have to abandon their monopoly over the policy process in favor of participatory models that invite input—and ownership—at all stages of development, from problem definition, to analysis, to identifying strategic options and making decisions.

Principles of representation and accountability must be extended to the global level. International digital brainstorms like Habitat Jam have the potential to trigger and shape significant changes in the way future societies will function. They signal the degree to which we are moving into an era in which the power and authority of international organizations, and the legitimacy of global decision-making, will become ever more dependent upon interactive democracy. But, leaders of international policy networks and GSNs must ensure that digitally enabled citizen engagement does not merely amplify the voices of organized interest groups that are already heard in policy-making. Some of the challenges for policy networks include: addressing social and political divides, ensuring there is an explicit relationship between citizen input and policy outcomes, and providing trusted public space where participants of all political persuasions will engage in policy deliberation. Most important, policy networks are an antidote to simplistic surveys that pose either/or or limited multiple-choice questions. More substantive deliberative models such as citizen juries, online consultations, deliberative polling and virtual question periods are leading options for broadening participation.



Endnotes

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- 11 Interview with Patrick Meier.
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- 38 Interview with Giles Gherson, Deputy Minister of Communications for the Government of Ontario.



About the Author



Anthony Williams is the executive editor for the Global Solution Networks program at the Martin Prosperity Institute and co-author (with Don Tapscott) of the groundbreaking bestsellers *Wikinomics* and *Macrowikinomics*. Among other appointments, Anthony is a senior fellow for innovation with the Lisbon Council in Brussels and chief advisor to Brazil's Free Education Project, a national strategy to equip 2 million young Brazilians with the skills required for a 21st Century workforce. His work on technology and innovation has been featured in publications such as *BusinessWeek*, *Harvard Business Review*, the *Huffington Post* and the *Globe and Mail*.



Global Solution Networks is a landmark study of the potential of global web-based and mobile networks for cooperation, problem solving and governance. This project is a deliverable of the research program, offered through the Martin Prosperity Institute at the Rotman School of Management, University of Toronto.

Program Management

Don Tapscott, Executive Director
 Dr. Joan Bigham, Managing Director
 Anthony Williams, Executive Editor

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Ten Types of Global Solution Networks