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The value of crowdsourcing A public sector guide to harnessing the crowd

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Why is the crowd important?

Many public sector organizations have been asked to do more with less and are increasingly expected to drive innovation. Their missions are vitally important for millions of citizens, yet they face stringent regulations, limited budgets and evolving workforce needs. What if they could augment their capabilities with hundreds of experts or tap into citizen solvers numbering in the thousands?

What if instead of relying on a handful of people, they could ask the other 99.99% of the world to weigh in? This access is the promise of crowdsourcing and the public sector has been experimenting with dramatic results. The crowd has already developed software for humanoid robots to complete tasks in space, created ways to predict mass atrocities, and even tagged millions of historical documents to reveal our past. The crowd can serve as a catalyst to jumpstart new thinking and increase organizational agility.¹

As Bill Joy, founder of Sun Microsystems, said, "no matter who you are, most of the smartest people don't work for you."² This ethos encapsulates the urgency for organizations to open their process so that the crowd can engage on the most vexing mission-related challenges.

The White House has led the way by releasing a "Federal Crowdsourcing and Citizen Science Toolkit" to accelerate adoption across the government.³ The private sector has also embraced the crowd with 85% of the 2014 Best 100 Brands using this approach in the past 10 years.⁴ These organizations have moved beyond the experimentation phase and are pushing to incorporate the crowd as a repeatable and flexible approach to solve some of the most intractable problems.

While the public and private sectors have both implemented crowdsourcing effectively, the applications differ in each setting. The private sector often sees the crowd as an alternative labor resource that can ultimately drive financial performance. The public sector primarily seeks to increase citizen engagement, increase public outreach, and open its mission to a broad audience. Public sector organizations have jurisdiction to challenge citizens to solve global and regional problems while companies may not seek the same level of impact.⁵ Some similarities do exist; both sectors use crowdsourcing to identify new ideas by tapping into the diversity of thought across the globe.

How is public sector crowdsourcing unique?Focus on citizen engagement

- Success measured in mission impact, not simply financial rewards
- High stakes to maintain citizen trust
- Impacts global and regional public policy issues, not one company

This paper explores the promise of crowdsourcing. It aims to offer some answers to three challenging questions facing the public sector when considering the use of crowdsourcing:



What is the value of the crowd?

When to engage the crowd?

How to begin with the crowd?

What is the value of the crowd?



The public sector is constantly challenged to adapt in the face of shifting conditions and priorities. Fixed budgets, limited staffing, and reactive tendencies can prohibit the agility required to solve critical issues. The crowd can generate breakthroughs for all types of problems whether long-standing, time-constrained, or newly emerging.

This approach offers value by:

- Generating diverse solutions
- Maximizing resources
- · Increasing civic engagement

Figure 1: Three potential benefits of crowdsourcing



quality ideas

Resource maximization Shortening the time to impact and efficiency



Gaining constituent participation and buy-in

While each of these are distinct, there are instances where organizations have targeted and achieved multiple benefits, although it is less common. An organization should target one benefit to maximize return instead of splitting focus between benefits resulting in lower combined impact. Public sector decision-makers who understand where and how the crowd adds value can better pair the strengths of the crowd with their own organizational needs. In this way, the crowd acts as a multiplier for enhancing organizational agility.



The crowd enables a public sector organization to source ideas from a vast array of people and organizations beyond the traditional means. These external problem solvers are less constrained by institutional bias that inevitably results when people with similar backgrounds approach problems through the same lens. As evidenced by the fact that over half (56.4%) of full-time federal workers are baby boomers and only 7.1% are under 30.⁶

For example, the **US military's African Command (AFRICOM)** needed new engagement strategies to combat illicit trafficking of narcotics in Africa. They engaged with WikiStrat to develop a scenario-driven simulation and exposed the problem to its global analytic crowd of over 2000+ analysts across 70+ countries.⁷ AFRICOM may not have produced such diverse strategies if it had relied exclusively on internal resources. The surprising result was that the consensus across this diverse group of millennials, retired generals and PhD academics favored the use of soft power instead of military might. Without this global crowd, AFRICOM may have only evaluated traditional means to address the issue of trafficking in Africa and limited its potential range of engagement strategies.

The crowd unleashes a broad spectrum of ideas that tap into the unique and diverse experiences from individuals around the world. This vast diversity of thought can be enhanced through crowdsourcing because many solvers are full-time employees elsewhere or may even by retired.⁹



GSA—Hackathons

AFRICOM—Crowd simulation

different countries, and PhD academics.⁸

By opening this challenge up to a global community,

These groups include millennials, retired generals from

AFRICOM accessed diverse thinkers not available internally.

GSA used the framework from a winning project in lieu of a \$500,000 procurement and producing a return on investment of approximately \$125,000.¹¹

Crowds can help maximize resources by tapping outside individuals and

focusing them on resource intensive problems. In public sector organizations, a lack of time, funding, or people, force tradeoffs and prioritization decisions. This approach can neglect critical, but lower priority tasks and even slow down selected projects to match existing resource constraints. Crowdsourcing can mitigate this issue by tapping external resources that are endowed with both time and energy, and who will often deeply devote themselves to these problems without requiring incentives.

For example, the **General Services Administration's (GSA)** annual hackathons are a chance to find products at a fraction of the cost and time of the typical procurement cycle. Hackathons are short events (24-48 hours) where computer scientists, designers, and other problem solvers come together to collaboratively program a technology solution. This activity usually involves a physical space where teams compete and experts judge the outputs for a cash prize.¹⁰ The GSA crowd-produced results have already saved the

government thousands of dollars in IT spending. In 2015, 16 teams created systems to visualize agency vehicle contributions to greenhouse gas emissions. They designed virtual tools that combine disparate data sets and improved travel booking procedures all in a single day.¹²

Through the crowd, an organization can be more flexible and creative with existing time, labor, and infrastructure. In many cases, this approach enables organizations to solve problems more efficiently, decrease time to impact, and pay for results rather than effort.

A government for the people and by the people can take on a new meaning with crowdsourcing. These approaches can allow organizations to reach constituents in new ways by empowering them to take an active role in solving government problems. This helps promote inclusive political ecosystems that foster healthy civic engagement. Crowdsourcing can help satisfy resourcing needs, but may also generate constituent excitement as they engage directly with public policy issues.

For example, the **National Archives and Records Administration (NARA)** contains more than 12 billion pages of paper records; however, the majority of its information is not always easily accessible. In 2012, the NARA capitalized on the archives' popularity to launch an effort to enlist the help of "citizen archivists". The term describes volunteers that are dedicated to making National Archives records more accessible online.¹³

The potential of the crowd can be very powerful. In some cases, it may even seem deceptively easy to harness. Many organizations that experimented with the crowd have achieved results through an iterative process marked with both successes and failures. Public sector organizations in particular still faces tough questions of when the crowd is most effective and how to ensure the proper type of engagement. Next, we explore these two topics in more detail and provide some more clarity to answering these vexing and, at times, intimidating questions.

When to engage the crowd?

While the crowd can often solve many problems faster, better, or cheaper, we see four common situations where the crowd has been used in exciting ways by other organizations. These instances present a starting point to incorporate crowdsourcing into regular patterns of work.

Figure 2: Four situations well-suited for the crowd









Public sector organizations should first consider spending time diagnosing their unique situation and assess suitability for crowd engagement. The organization should choose only one situation and then expand to others in future crowdsourcing efforts. If an initiative attempts to address multiple situations, then the effort will likely lack focus and objective selection can become convoluted. This strategic review is critical because of the significant investment required before launch. This targeted planning effort increases the probability of results from allocating limited resources.



Benefit 3—Increased engagement Gaining constituent participation and buy-in

NARA—Citizen archivists

Since its inception, citizens have tagged over 10 million documents, compiled metadata for enhanced search functionality, and performed millions of digital transcriptions.¹⁴



NHLBI—Strategic vision

4,450 users registered to contribute (from all 50 states and 42 countries) and provided 1,234 ideas and cast 42,000 votes for the NHLBI Strategic Vision.¹⁵

Examples of crowd inputs for issue analysis

- Real-time observation data
- Diverse opinions from non-experts
- Smart questions for future research
- Multimedia (photos, GPS tags, etc.)



Organizations may, at times, desire a deeper understanding of an issue, however, traditional means may have significant tradeoffs (e.g. time, cost,

access). Some expensive methods include running focus groups, convening a task force, or hiring research firms. Conversely, crowds can provide near real-time observations and give perspectives outside these traditional populations.

For example, the **National Heart, Lung, and Blood Institute (NHLBI)** engaged a broad set of stakeholders (e.g. patients, researchers, and clinicians) to understand the key research questions to focus on its new strategic vision. The agency could have relied on experts and internal resources; instead, they went beyond the walls of their organization to capture hidden trends. NHLBI accepted inputs through an ideation platform and used experts to validate 166 out of 1234 ideas. These results broadened NHLBI's view of the field and better aligned its strategy to the existing reality.¹⁶

With the explosion of digital technology adoption, it is easy to reach the crowd to elicit rapid, current state assessments. For those organizations that want to become more customer-oriented, the crowd approach gains both customer insights while simultaneously improving engagement. If the issue is more highly specialized, then crowdsourcing could target experts who can contribute on a part-time basis. While these crowd outputs are not "solutions" to address the problem directly, these insights provide the basis for better informed policies and future actions

When an organization needs innovative solutions to a challenge, the crowd can provide a jolt to inspire even more creativity. This situation occurs when an organization possess a deep understanding of issue, but has exhausted conventional sources to generate a solution. The crowd can help by providing diverse thought and combining disciplines to create new insights.

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For example, in support of the first humanoid robot in space to take over dangerous tasks, **National Aeronautics and Space Administration (NASA)** did not have a viable way to teach the robonaut how to interact with the input devices used by astronauts. NASA opened the problem to the topcoder crowd community and launched a \$10,000 algorithm challenge to develop an efficient way for the robot to recognize buttons on the task board.¹⁸ Out of 304 submissions, four quality algorithms were received and could supplement NASA's software development for the robot.¹⁹ These ideas jumpstarted NASA process and allowed them to rapidly mature the robot's usefulness in space.²⁰

A crowd mechanism to gather new solutions can take many forms – grand challenges, ideation prompts, hackathons, etc. One increasingly popular approach is the use of incentive prizes; however, it not necessarily the only means to address this situation.²¹ Regardless of the format, the crowd can provide a deluge of new ideas and solutions that often are more diverse, rapidly developed, and cost less than traditional means.

Public sector organizations often experience uncertainty when preparing a new solution for implementation. Instead of refining in isolation, an organization can open the testing phase to the crowd to receive rapid feedback. An organization can create an environment for the crowd to test their ideas, provide feedback on proposed solutions, or collaboratively refine a solution.

NASA—Robonaut

The challenge produced 304 submissions from 40 competitors across 16 countries. NASA received 4 quality algorithms that they integrated into Robonaut's software for use in space.¹⁷

The craft of incentive prize design

For more in-depth insights on designing and executing prizes please refer to the recent Deloitte University Press article—**The craft of incentive prize design.**



FDA—Precision medicine

The PrecisionFDA platform allows the agency to see how science evolves in real-time and gives scientists an opportunity to collaboratively test new methods.²⁴



Smithsonian—Digital volunteers

These transcription micro-contributions has freed full-time researchers from repetitive tasks and volunteers have a sense of pride in directly contributing to the Smithsonian's mission.²⁸

The future of labor

The U.S. currently has 30.2M independent workers relying on freelance, contract, or on-call work. By 2020, it will be 37.9M—about 30% of the total private workforce in America.³⁰ For example, the **Food and Drug Administration (FDA)** has released a new collaboration platform to advance medical care tailored to an individual's genetic make-up.²² FDA desired a collaborative environment that engages the genomics community to test and refine this nascent approach to medicine. PrecisionFDA is a portal where genomics research and development is conducted collaboratively in a digital environment.²³ The crowd researchers can compare test results with crowd-provided reference materials and pilot new methods.²⁵ This platform allows FDA to observe how the science evolves in real-time and will facilitate a more accurate development of standards required for this new approach.

On the most basic level, this testing could take the form of a voting or rating button or could be a dynamic virtual environment for the crowd to share data and collaborate. Many public sector solutions can impact various stakeholders and using the crowd to test and refine these ideas can provide a safe environment to seek valuable feedback and lower the risk of failure.

Public sector organizations are chronically under-resourced in fiscally austere

environments. Organizations may postpone critical projects that call for repetitive tasks and need a brute level of labor to complete (e.g. data entry, coding) or also more creative in nature (e.g. infographic). An emerging crowdsourcing trend is called microtasking. It is defined as "employing technology platforms to distribute small, discrete tasks to online workers."²⁶

For example, the **Smithsonian Institution** has embraced open collaboration by launching the Digital Volunteers initiative. Passionate citizens virtually support the Smithsonian Transcription Center which helps to make collections more accessible online.²⁷ The volunteers transcribe historical documents into digital text which makes the artifacts machine readable.²⁹ All these micro-contributions provide inputs used to accelerate the full-time researcher's work by freeing them from time-consuming tasks. Volunteers may see value in interacting with history in this way and may feel a sense of pride in helping to achieve the Smithsonian's mission.

The input format may vary (e.g. photo, text, or a geo-tag), but developing a crowd mechanism to disperse this work can complete projects in a more flexible way. The crowd engagement cost may even be negligible if the workers agree to a volunteer relationship. This approach releases full-time employees to focus on high impact activities while engaging the public in the important work of the government on a part-time basis.

Many public sector organizations are challenged to identify the right opportunity for crowdsourcing; however, emerging trends already threaten to upend their operations. With baby boomers set to retire in droves and more workers desiring a virtual relationship, a robust crowd workforce will be a necessity.³¹ It can be overwhelming when considering all the risks or perceiving the crowd as the right means to the end. Leaders should consider the potential risks in skipping this diagnosis phase and first analyze their situation before launching into a "crowd-first" mentality.

How do I start to engage the crowd?

Deciding on the right situation to engage the crowd is not enough. Poor design, planning or execution can derail even the best-intentioned crowd initiatives and may jeopardize public support for an organization. Many organizations are obsessed with picking the right technology platform, but if the effort is focused on the wrong objective then the outcome may be unsatisfying. If properly framed and designed, then the crowd effort will naturally lead to the proper technology vendor to satisfy that need. Most organizations that maximize the crowd's value initially focus on selecting the right objective within their identified situation, design to achieve that objective, and sufficiently resource the execution team.

Figure 3: Getting started with the crowd—three major steps



These sequential steps provide a clear and deliberate path to ensure the crowdsourcing effort is targeted, customized, and properly resourced for maximum success. Public sector leaders should engage the crowd with the same vigor and focus devoted to traditional methods. Although, organizations should find ways to remain flexible enough to shift direction based on real-time crowd feedback.



DOE—Sunshot Prize

The DOE Sunshot Prize is laser focused on minimizing time for solar panel installation. Five teams have joined to compete for the \$10M prize. One team has even set its target to one day for the complete process from permit application to final inspection.³³



Understanding and clearly articulating the crowd's objective is paramount

to success in the public arena. Without clear vision, organizations risk achieving unintended and infeasible outcomes, which could upset key constituencies. Once the situation is identified (e.g. obtaining ideas), then the organization can determine which type of objective (i.e. crowd request) will most impact this specific reality. This relationship between crowd function and strategic priorities is exemplified through the Department of Energy's SunShot Prize.

Since 2010, the **U.S. Department of Energy (DOE)** has sought to make solar energy costcompetitive with other forms of energy.³² Their strategic goal is to reduce the costs of solar to 6 cents per kilowatt hour and increase the share of solar-generated power to 14% of energy production by 2030. With this clear goal in mind, DOE launched the SunShot Prize, a crowd-based initiative focused on a prime cause of solar power's high cost. This driver is the time it takes to obtain a permit, install, and inspect solar systems. This \$10M prize seeks to remove bureaucratic red tape across various stakeholders (e.g. communities, solar companies, and electric utilities). The objective of this crowd effort is clear and simple – teams must shorten the current process from over six months to just 7 days.³⁴ By avoiding the temptation to address all cost drivers, DOE has focused the resources of the crowd to achieve maximum impact.

Identifying the objective and communicating it concisely to the crowd requires a strategyfirst approach. Possessing knowledge of the problem is a start, but articulating the crowd's function is equally important to focus the crowd's energy in the most optimal way.

There are a myriad of design choices that create productive environments for

crowd engagement. The organization should consider how this initiative should be structured internally to be successful. How many resources are available to support and drive this effort? The organization will also need to determine what they are asking the crowd to do. Do they need to produce an app or provide a written idea with a 100 character limit? This "what" question is inherently tied to the previously-determined objective for the crowd.

For example, **US Agency for International Development (USAID)** in partnership with Humanity United engaged the topcoder crowd to obtain new data models that predict when and where atrocities will happen at the sub-national level.³⁵ The modeling challenge had a total prize purse of \$25,000 that was claimed by five non-US winners.³⁶ The challenge

USAID—Atrocity prevention

USAID received over 618 submissions for a model to predict where and when atrocities will happen. Five winners (all non-US) developed models that will increase the world's predictive ability to prevent these events.³⁸



had specific requirements where the teams had to train their model using a particular dataset and then their predictions would be tested and scored on new data.³⁷ These objective requirements are explicitly stated with detailed rules; therefore, those who enter know exactly what to expect and what they need to do to be successful. The challenge produced a valuable outcome by proving that quantitative methods to forecast mass violence were possible where previously it was believed that these events might be too random to predict.³⁹

Another critical question is who will be in the targeted crowd? Crowd participants can range from subject matter experts to completely unexposed citizens. Does the organization want to expose 100 PhD scientists or does it need 100,000 citizens? Once the crowd population is determined, then this may naturally lead to a specific type of platform (e.g. topcoder for prototyping or data science problems) that is best suited to reach that particular crowd. All these design decisions will flow from the objective, but this process should be iterative within the organization's planning team and sometimes even with those in the crowd population.

A major pitfall when tapping into the crowd is mismanagement. As with any major project, organizations need to invest in tools to track progress and

actively manage the crowd. This requires proactive planning, proper staffing, and an action plan for post-crowd engagement. Even the best-designed crowdsourcing efforts can fail in implementation without detailed plans and contingencies. How will the work be divided and distributed among the crowd participants? How long will this effort last and are teams needed? When are the deadlines or is this an on-going initiative? The stakes are even higher for public sector individuals who risk alienating the very constituencies that crowdsourcing is meant to engage.

Government decision-makers face many communication and implementation challenges when harnessing the crowd. After attracting its desired population, how does an organization communicate with participants? This interaction can be passive or it may require additional real-time support. How and when should the organization plan to validate submissions? Success for public sector leaders hinges on momentum. As a result, organizations often struggle to transform engagement into impact. Boston's vision to reinvent the 50 year old City Hall Plaza provides a clear example of providing organizational support for a relatively simple crowd engagement.

In 2015, Martin J. Walsh engaged his constituents in the process for redesigning **Boston's City Hall Plaza**.⁴⁰ The mayor crowdsourced proposals from Bostonians to gain a diverse set of ideas beyond the traditional design and architectural firms.⁴¹ The vehicle was a simple twitter campaign and resulted in 292 tweets ranging from landscaping to housing suggestions.⁴³ The management approach was structured, well resourced, and blended traditional and crowd sources.⁴⁴ The mayor's office employed a full-time staff to monitor projects and had a request for proposal process that would realize tangible results from this public conversation.⁴⁵ This approach successfully generated trust from participants because of the post-engagement plans crafted by the mayor's office.

Consider the alternative to the mayor's active approach. Public leaders that fail to aggressively execute crowd efforts risk being overwhelmed by a flood of ideas or embarrassed by a dearth of responses. The consequences in the public realm are greater than the private sector. Public leaders risk not only the success of the effort, but the support of constituents they represent.

Boston—Reinventing City Hall

After receiving 292 crowdsourced ideas, the mayor's office had a plan for how to harness crowd engagement. They provided the necessary internal and external resources to enable smooth execution of these ideas.⁴²

For example, a western European government asked its citizens to provide new solutions for agency issues. Instead of implementing any of the 9,500 ideas, each agency simply restated existing government policy.⁴⁶ While this government has successfully executed other crowdsourcing efforts (i.e. receiving 100,000 responses for cost-cutting suggestions targeting \$700M in savings), it only takes one instance, when the government is not fully prepared, to potentially erode credibility from a public perception that time was spent with little result.⁴⁷ The complexity of the crowd can challenge even the most sophisticated organization. Organizations should enter these efforts knowing the risks and approach their execution with the same conscientious determination they would apply to any complex project.

What is next for the crowd?

Many of the most forward-looking public sector organizations are already using crowdsourcing to accelerate problem solving, but what can this reality look like over the next 5 years?

Organizations will likely no longer see crowdsourcing as a special project or risky proposition; instead they will likely view it as the only tool to meet certain needs. Budget proposals will likely include line-items for multi-million dollar prizes and flexible funds for on-demand experts with little to no contractual relationships. Typical contract and program managers will likely morph into crowd ambassadors and new certifications will likely emerge to exhibit competence in crowd management.

The future of crowdsourcing will likely involve more diverse participants and demand that public sector employees reimagine themselves as partners who depend on the masses to accomplish their work. Institutional inertia will likely melt away in favor of a more open process where accountability can be shared across officials and citizens. It may not be unrealistic (and even significantly cheaper) for many projects to be entirely crowdsourced from idea to large scale production with only minimal guidelines required to keep the crowd on track.

The crowd is not a panacea, but offers inspiration for what constituents can offer to its public institutions. Crowdsourcing is just too valuable to ignore as evidenced by the ingenuity of regular people who have already successfully solved some of the most vexing public challenges. It is time to maintain and accelerate this momentum. Public sector leaders should rapidly invest in the capabilities needed to harness the crowd and effectively realize its promise of a transformational problem solving revolution.

Contacts



Jonathan Baba Principal Deloitte Consulting LLP +1 540 687 1952 jbaba@deloitte.com Jon leads Deloitte's Federal practice enterprise strategy solution offerings. In this capacity, he is helping drive the firm's Federal crowd based capabilities. Jon brings over 20 years of experience bringing together experts and stakeholders to solve critical client issues through the use of strategic simulation and wargaming methods. Jon is coupling this experience with the emergence of technology platforms to enable greater involvement of talent, expertise, and labor in addressing a broad array of client issues.



Keith Rodgers Senior Manager Deloitte Consulting LLP +1 216 346 0885 krodgers@deloitte.com Keith is a Senior Manager in Deloitte's strategy practice. As one of the leaders of the enterprise strategy solution offering he has helped shape the crowdsourcing capability that the firm is providing public sector leaders. Keith has nearly 15 years of experience leveraging innovative techniques to assess organizations and provide high-stakes strategic solutions. Keith is utilizing his experience to assist Government executives as they navigate an increasing disruptive environment, boost performance, and anticipate change by wielding the power of the Crowd.

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