

Opening Government: Designing Open Innovation Processes to Collaborate With External Problem Solvers

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Ines Mergel¹

Abstract

Open government initiatives in the U.S. government focus on three main aspects: transparency, participation, and collaboration. Especially the collaboration mandate is relatively unexplored in the literature. In practice, government organizations recognize the need to include external problem solvers into their internal innovation creation processes. This is partly derived from a sense of urgency to improve the efficiency and quality of government service delivery. Another formal driver is the America Competes Act that instructs agencies to search for opportunities to meaningfully promote excellence in technology, education, and science. Government agencies are responding to these requirements by using open innovation (OI) approaches to invite citizens to crowdsource and peer produce solutions to public management problems. These distributed innovation processes occur at all levels of the U.S. government and it is important to understand what design elements are used to create innovative public management ideas. This article systematically reviews existing government crowdsourcing and peer production initiatives and shows that after agencies have defined their public management problem, they go through four different phases of the OI process: (1) idea generation through crowdsourcing, (2) incubation of submitted ideas with peer voting and collaborative improvements of favorite solutions, (3) validation with a proof of concept of implementation possibilities, and (4) reveal of the selected solution and the (internal) implementation of the winning idea. Participation and engagement are incentivized both with monetary and non-monetary rewards, which lead to tangible solutions as well as intangible innovation outcomes, such as increased public awareness.

Keywords

crowdsourcing, open innovation, peer production, public sector

¹ Syracuse University, Syracuse, NY, USA

Corresponding Author:

Ines Mergel, Syracuse University, 215 Eggers Hall, Syracuse, NY 13210, USA.

Email: iamergel@maxwell.syr.edu

Introduction

The recent open government initiative of the Obama Administration has focused on three priorities (The White House, 2009b): Opening government by (1) increasing transparency, accomplished by giving citizens access to government information through a national platform called Data.gov (see, e.g., Janssen & Zuiderwijk, 2014); (2) improving participation in governance processes, implemented by actively asking citizens for their petitions and providing opportunities to comment on regulations in progress; and (3) collaboration, mandated as part of the America Competes Act to integrate stakeholders in the work of government by identifying new opportunities for cooperation.

Opening government to allow the integration of external innovation is a challenge for public sector organizations: Innovation traditionally occurs through incremental adjustments of standard operating procedures to improve the effectiveness and efficiency of service delivery or it occurs through a formal request for proposals inviting previously vetted vendors and contractors to offer outsourcing possibilities for innovation creation (see, e.g., Boyne, 2003). Many innovations occur through a political mandate that provides additional resources to introduce more complex innovations, such as new policies that then lead to administrative action. This resource-based view of public sector organizations is in alignment with the bureaucratic understanding of hierarchical organizing: Public sector organizations need to rely on resources residing inside the organization rather than outside innovation (Wernerfelt, 1984).

Recently, government organizations have started to adopt open innovation (OI) approaches to provide an additional gateway for innovation creation that allows citizens to suggest solutions to public management problems (Chesbrough, 2003). This view of the organization expands the resource-based view, from which public sector organizations are mostly focusing on their internal capabilities to create innovations. An OI approach extends the boundaries of the organization to harness external information advantages and allow for knowledge to flow into the organization from the external environment and is contributed especially from actors who were traditionally not involved in the innovation creation process (Peteraf, 1993; Teece, Pisano, & Shuen, 1997).

OI is a concept that was originally adopted in the private sector to invite problem solvers help reinvent products, services, or even business models that might contribute to the survival of the organization (Chesbrough, 2003, 2006). For the public sector, the concept of OI has recently been adopted to increase the use of innovative knowledge contributed, but citizens and other government stakeholders to help solve public management problems. The first time the concept was used was in the context of National Aeronautics and Space Administration's (NASA) Centennial Challenges to search for technological solutions, but to increase public awareness for the agency's programs and receive public support for increasing budgets.

However, OI is still mostly a theoretical concept that needs to be translated to the public sector context in order to understand to what extent and how OI approaches are used to open government and increase collaboration. This article first introduces the dimensions of OI and then surveys the current landscape of publicly discoverable OI initiatives to especially gain a deeper understanding of the design elements, such as incentives encouraging the crowd of potential problem solvers, the phases of the OI process itself, and potential outcomes of the process.

In order to answer these questions, the research team used a multimethod approach: (1) All 23 OI initiatives adopted by U.S. government organizations were systematically reviewed to identify the three design elements and their online platforms were coded; (2) the quantitative analysis was supplemented with qualitative interviews with OI managers in 10 public sector organizations representing all levels of the U.S. government to better understand the extent of implementation and the decisions that lead to the design of the observed processes; and (3) the two data sets were triangulated with the literature and compared to emerging themes from the data.

Findings show that there is not one single OI approach to access innovative ideas from the public; instead, government organizations are using a variety of approaches along a continuum that moves

from general crowdsourcing and to task-specific peer production, with a (currently not realized) potential for future collaborative implementation of the innovations. Along this continuum, increasing managerial coordination is required to design each phase of the OI process and guide the crowd to provide expected solutions to public management problems.

OI for Distributed Innovation Creation in the Public Sector

OI is a concept coined by Chesbrough (2003, 2006) who introduced the use of external problem solvers to create internal innovations. Instead of relying only on in-house research and development units and their traditional practices to develop new products, private sector organizations were looking for new models of product and market development that resided outside the organization. Using Von Hippel's (1988, 2005) user-centered approach, the consumer is at the center of the innovation development process. OI initiatives make use of "the crowd"—anonymous or targeted audiences who represent potential buyers and other stakeholders of the organization. Subsequently, Chesbrough (2006, 1) defined OI as "the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively."

OI processes are supported by an online platform through which the problem statements are distributed and problem solvers submit their solutions. The problems range from simple design campaigns, for example, designing a new logo for a brand or designing a new ad campaign for a product (see, e.g., Davis, 2013, analyzing Lego's design contests), to complex technological problems that may lead to the survival of an organization or the discovery of a new market with the goal to attract new customers and increase the organization's market share. A prominent example is the use of a contest with the goal to redesign the movie suggestion algorithm of the videostreaming service Netflix. The winning team of professional statisticians and mathematicians won the prize money of US\$1 million (McKinsey & Company, 2009).

Applying OI Approaches in the Public Sector

While OI approaches in the private sector are used to introduce both incremental and radical changes to an organization's business model and may contribute to the survival of a business organization, the transfer of the concept to the public sector needs to take the unique characteristics of the sector into consideration. In government organizations, OI is seen as part of the open government initiative to move from a closed innovation paradigm that relies on preselected vendors and contractors to an OI paradigm encouraging citizens to increase their participation and collaboration with government (Felina & Zenger, 2014). However, it is rarely used to revolutionize the public sector to come up with a new business model for government, new products or to abandon parts of the population that might not be deemed profitable or adding to the bottom line (Obama, 2009; The White House, 2009a, 2009b).

OI in the U.S. government is institutionalized as part of the open government initiative to increase specifically collaboration with stakeholders. The America COMPETES Act (2007) lay the foundation for a new policy instrument called Challenges and Prizes (The White House, 2010) through which federal agencies are encouraged to use new technologies to actively seek input from amateur as well professional problem solvers to help solve public management problems. Early initiatives include contests, such as civic hackathons, to reuse public sector information shared by government on open data platforms (Chan, 2013). Others state that public sector OI's goal is to increase public service delivery to create public benefits and improve public participation (S. M. Lee, Hwang, & Choi, 2012).

However, the simple transfer of the OI concept from the private sector to the public sector has its limitations. Due to the nature of the public sector, radical innovations, such as a redesign of the business model, the invention of new products (or policies) and decisions based on Return on Investment calculation are not applicable to government organizations. Instead, innovations can occur at the

margins, for example, to increase the effectiveness and efficiency of public service delivery, increase of public awareness for existing programs, or simple research tasks to better understand constituents' needs.

The publicness character of government organizations prevents truly groundbreaking solutions that would lead to the redesign of the public sector; instead, core public sector principles such as equity, accountability, and transparency need to be taken into account. Public sector organizations are in large parts influenced by political authorities to act in the public interest and produce public goods and services that are accessible equally to all citizens (Bozeman, 1987; Bozeman & Bretschneider, 1994).

Innovation Aggregation and Idea Collection Processes

The underlying process of OI is oftentimes characterized as crowdsourcing (Howe, 2006b). Howe (2006a: n.p.) defines crowdsourcing as “functions once performed by employees and outsourcing it to an undefined (and generally large) network of people in form of an open call.” Surowiecki (2004) extended the concept beyond the procedural aspect and focused on the value of the crowd's contributions based on its sheer numbers and their assumed collective intelligence and knowledge. The crowd itself does not have to be defined by set boundaries or strict shared attributes; instead, the wisdom of the crowds concept assumes that due to the heterogeneity of large crowds a diverse set of experience and knowledge is accessible to the crowdsourcing organization.

In 2006, Benkler developed the concept of commons-based peer production which describes “a socio-economic system of production that is emerging in the digitally networked environment” (Benkler, 2006; Benkler & Nissenbaum, 2006:394). Benkler's notion of peer production focuses not only on the general collection and aggregation of knowledge that is available outside an organization, but specifically includes the task-oriented and cooperative nature of the (online) process. Examples of peer production include the collective writing and editing of Wikipedia entries or open source software code, where—following a power law distribution—the majority of the contributors provide microtasks and only a handful of participants provide the majority of the content (Adamic & Huberman, 2000). In the public sector, NASA is collaborating with TopCoder, a company that breaks up large-scale software projects into small work packages. The rather complex technological problems of software development are broken into smaller manageable pieces that can be easily solved by the crowd (King & Lakhani, 2013).

In the public sector context of OI contests, citizen problem solvers are assumed to serve as the crowd—a rather anonymous mass—with wisdom in the form of knowledge that can contribute to the creation of public goods. However, crowdsourcing approaches need to be distinguished from the concept of coproduction of public service delivery (see, e.g., Bovaird, 2007; Voorberg, Bekkers, & Tummers, 2014). Coproduction focuses on a specific existing government service that is provided with the help of citizens as partners in the process—where both government and citizens share power (Ostrom, 1996). Examples include participation in the budget planning and decision making processes (see, e.g., Ebdon & Franklin, 2006) or codelivering 311 services (Clark, Brudney, & Jang, 2013). Lee et al. provide an overview of other government- and community-led OI practices in the public sector (K. Lee & Pennings, 2002). What is so far underexplored is how these processes are designed in the public sector and how process design features vary across OI initiatives.

Research Design

In order to answer these research questions, the data collection and analysis are organized in three waves applying a multi-method approach. An iterative research design helps to select a sample of

field-based data that appropriately captures the contextual conditions of the realities of the studied government organizations.

Data Collection and Analysis

The initial data collection started with a list of publicly discoverable OI initiatives included in the Appendix. While many government organizations do not explicitly use the term OI or even crowdsourcing, initiatives were included in the final sample when they included crowdsourcing elements (e.g., explicit calls for input, submission requests, etc.). The list includes 23 government initiatives on all levels of government, among them the federal government's Challenge.gov platform that serves as a central contest and marketing platform for currently 25 federal agencies. Eight additional other federal crowdsourcing sites were included, which use crowdsourcing processes to encourage collective problem solving with external stakeholders. Only two state-level initiatives were publicly discoverable and 12 local government initiatives complete the sample (see Table A1 in the Appendix for an overview of the included cases).

Each initiative's online platform was coded and categorized using the following codes: level of government, mode of the crowdsourcing approach, the target crowd, platform costs in US\$, available external funding, potential role of a vendor, the available prize money or other nonmonetary incentives, the phases of the ideation process, expected outcomes of the process ranging from simple public awareness, education, and information sharing to tangible products such as software code or smartphone apps.

The online web site coding effort was complemented with 35 semistructured qualitative interviews with public managers on all three levels of government. Interview partners were recruited to gain insights into the decision making that lead to the publicly observable crowdsourcing processes. The interviews were transcribed verbatim and hand-coded line-by-line using the qualitative data analysis software NVivo (2014), leading to thick descriptions of the design elements of crowdsourcing initiatives. The main themes covered in the semistructured interviews include information about the public management problems to be solved, top-management buy-in, institutional considerations (such as legal barriers), goals of the contests and crowdsourcing process, types of requested submissions, phases of the contest designed for the desired outcomes, actual outcomes, and the extent to which once submitted innovations from the public were subsequently implemented in government. Additional themes emerged from the data following a grounded theory approach (Glaser & Strauss, 1967).

Finally, the insights derived from both quantitative and qualitative data collection efforts were subsequently triangulated with the existing literature on OI, crowdsourcing, and peer production to make sense of the data (Yin, 1994).

Findings

The design elements of OI processes include varying phases or steps of the ideation process, monetary and nonmonetary incentives for problem solvers' participation, and expected outcomes how a public management problem is solved. In the following, each of the design elements is discussed.

Overall, almost 40% of the organizations represented in this sample did not use a vendor to set up their own OI process and used their existing budgets to run OI contests. About 33% used a hosting site, such as OpenIdeo, Spigit, UserVoice, or ChallengePost and then embedded the hosting sites' external content into their own e-government site. The other 27% of government organizations represented in this sample fully outsourced the crowdsourcing service and either linked to a site from their homepage or rely on other ways to promote their OI efforts.

The majority of government organizations (70%) did not access any additional outside funding to support their OI efforts. Costs for platforms are rarely made public: For almost 80% of the platforms, no cost estimate or expenses were discoverable on the OI site, or in accompanying records, memos, and government budgets. The largest expense was reported for the initial design, redesign, and hosting of challenges and contests on the federal OI platform Challenge.gov with an initial cost of US\$3.25 million, followed by a US\$500,000 expense for a state government initiative and US\$25,000 to US\$80,000 for three local government OI initiatives.

Design Element 1: Incentives for the Crowd

Incentives include monetary and nonmonetary incentives for participation. Both forms depend on the type of public management problem a government organization is aiming to solve, as well as the type of crowd (or problem solvers) who is targeted and involved in the process.

The majority of OI initiatives are open to anyone who discovers the OI platform online and to those who are willing to spend time to develop and submit solutions. Marketing efforts in this sample include banners on an agency's web site, commercials on local TV channels, e-mail signatures, and reminders on tax, water, or sewer bills to increase awareness for the OI initiative. About 60% of the initiatives are open to the general public, are not restricted to specific geographic locations (such as a zip code, city, or state), and do not require a specific skill set. As one of the interview partners in a city government explains, they allow "anybody [who] wants to contribute as we hope to engage the people. We are providing paper copies and forms at [town hall] meetings, so it's not just ideas coming through electronic tools. We're trying to engage the folks who want to take ownership in the transformation of the government." The problem solvers can therefore be a mix of government employees, the general public, or school classes interested in learning about government participation.

Thirty percent of the OI initiatives address specific problem solvers, with dedicated software development skills who are able to work with government application-programming interfaces (APIs) to download and code open government data sets as part of a hackathon. Another 10% of the OI initiatives were solely directed at government employees with a specific focus to discover solutions for internal and external process improvements. This final category has emerged as a digitized "suggestion box." Depending on the targeted crowd of problem solvers, OI initiatives in government apply a series of outreach and marketing activities to overcome the notion that simply because a site exist does not mean that citizens are actually willing to contribute. One city has created a team to organize the outreach activities: "We are right now where we have created a committee that is going to start focusing on selling the idea to get more input. Without any marketing we have probably got a couple of a hundred suggestions already."

As a result, the incentives provided to the problem solvers can be categorized depending on the crowd and the expected outcomes. Seventy-eight percent of all initiatives do not provide any monetary prize purse and 83% did not even specify any explicit nonmonetary prize. However, the agencies that do advertise a nonmonetary prize, use public recognition prizes, such as a public announcement of the winner, a day named after the winner, a day spent with the police chief, or a lunch with the county executive.

The OI initiative in Harford County uses gaming elements to incentivize participation: Citizens earn points for their submissions, every time they vote on each other's ideas or leave comments to improve an idea. The virtual currency can then be transferred into cash to purchase items in the county store. Other initiatives use a similar approach, but instead of honoring virtual currency with cash, they use it to increase a citizen's reputation which can then be used to select a prize.

Design Element 2: Phased Approaches

Government organizations are using parts or all phases of the OI processes. Selected agencies go through the full set of phases engaging problem solvers not only in the idea generation but also in the active review, improvement, and implementation phases.

Phase 1: General idea collection. The first phase can be divided into a pre-phase of the idea collection process during which the agencies define a public management problem that serves based on a challenge posted to the public, and an idea collection process without any predefined public management problem to solve.

The former approach is highly specialized: Public managers usually have a certain solution in mind or run a contest for a specific purpose, for example, to increase public awareness of a new government program. The latter approach is built on a legacy system of an existing employee reward system with an added idea crowdsourcing component.

Instead of a specific outcome, the goal of a broad sweep of ideas is to open a communication channel between government and citizens, which does not necessarily need to serve any other specific improvement of services or government programs. This unstructured ideation process is designed to lead to more sophisticated procedures as one of the public managers explained: “We’re really looking to try to move that more towards a crowdsourcing kind of idea, where somebody champions an idea, gets support for it, and then moves it up. But we do have a traditional suggestion component where we encourage people to supply ideas anywhere across the organization. And they’re rewarded with, depending on what the idea is, some monetary value or things like that.”

In this sample, government agencies are using five different crowdsourcing efforts. For simple, nonspecific idea generation practices, 5% of the initiatives are using structured surveys to solicit answers to specific questions, and 26% are using the platforms for simple freeform information submission purposes. One of the public managers observed that in his agency, “40% of our department directors are actively engaged in either reaching out to people for ideas, or responding back to ideas. And it is really meant to be a two-way program, where you know, you participate in helping people find solutions.” Another 31% are calling specifically for creative solutions, such as design contests. Twenty-six of all contests are identifiable as app contests, where agencies specifically host a hackathon inviting civic hackers to reuse public sector information in the form of open data sets and build smartphone applications. At the other end of the spectrum, only about 5% of all contests included specific labor or microtasks. The rest of the OI contests were unspecified.

Overall, 56% of the OI initiatives stop their efforts after Phase 1 is completed, are not moving on to judging the submitted ideas or selecting the winners among them.

Phase 2: Selection of ideas and judging of winners. The selection of ideas and the judging process is used by about 5% of all OI initiatives. Those organizations that are committed to using the outcomes of their OI practices follow three different approaches: (1) Simple internal review, (2) citizen votes on favorite ideas, or (3) (celebrity) external and internal judges who serve as knowledge experts.

The internal review is used for general idea solicitations, where there is no specific public management problem to solve. Internal staff is proactively reviewing ideas as they come in through the site. One of the interview partners explained the internal decision making in his agency: “What we are doing is in a couple forums, if [the ideas] are real specific to a task, they are not strategic, they get evaluated at a department director level head. Once they are nominated for approval, that’s pretty much all it takes. Doesn’t need to go further than that. A more strategic idea gets vetted across larger groups. That depends on what the idea is. So if there are citywide implications, it would have to go up through a city manager or some area other than a department head.” Generated ideas might have immediate tactical value to a government agency and can be easily moved to the implementation

phase, while other ideas might have direct implications for a department's budget and need to go through a more rigorous internal vetting process.

The second selection process—crowd judging—takes citizens' votes into account. Agencies using this process, such as San Diego's WikiPlanning project, design the general idea generation phase with a specific deadline and goal in mind. After the deadline, the community of problem solvers is again invited to vote on submitted ideas and final decision makers are only taking the highest rated submissions into account. As one of the public managers described the process, "As ideas start populating, you can get to vote on ideas that you believe are important to you for whatever reason you support them. You comment on them, as well as you vote. You get ten votes right now by default, but we can change that as we go through the process, we can add more votes. Right now 10 seem to be okay, no one has asked for more yet. When ideas are completed, and they are either marked as yes we are doing this, no we're not doing it, your votes come back to you. Once you vote on something, it's implemented or it's decided that it's something we can't do, you get to vote again."

An additional element to the citizen-driven selection phase is to ask problem solvers for a proof of concept of the idea. This can include additional research for costs, implementation steps, legality, feasibility, sustainability of the concept, or recommendations how to cover the costs. As one of the interview partners says, "It's not about top down, it's about grassroots initiation of ideas." This process not only moves the creative idea generation responsibility to the community but also allows the community to create an understanding of what costs government needs to bear when it comes to the implementation of community-led ideas and at the end a higher awareness of the limitations for innovations in the public sector. One public manager explains that their staged voting process is helpful to "let the community see that we are actually letting them be part of the solution," and "You are basically putting the ball back into the citizens' court, because it's their money that we are using to serve them."

The third option for idea selection is a review panel staffed with celebrities, such as politicians. The intent is to create increased awareness for the process itself and the availability of the outcomes of the OI initiative. The announcements are connected with a public award ceremony. Publicity in turn helps to increase trust in the process. Citizens are given the credit for their submissions to indicate that government values their ideas. Celebrity panels or steering committees oftentimes include high-profile government officials and one public manager explained the reasoning behind the staffing: "The mayor sees the benefit of the technology, but it is allowing us to speed up a lot of the process. He is reaching out to anyone who wants to participate. The size of the steering committee that we have sounds kind of big, but it is really to get those people in front of [citizens]. The technology comes later, but it is getting the people in front of the citizens, and explains about the program, any ideas."

Phase 3: Implementation of OI outcomes. About 31% of all OI initiatives include an implementation or action phase in which the citizen innovations are adopted by the organization or government has to respond to a call for action. However, for the majority of the initiatives included in this sample, there was no evidence that the suggested ideas were implemented. Typically, OI outcomes include general ideas solicited for service improvement (48%), a creative product such as a design solution for a poster, an app, or a new process how to reach otherwise disconnected parts of the citizenry (31%), or general information and data, for example, in the form of geographic locations of sites, impact information on citizens, and so on (22%).

Design element 3: Intangible and tangible outcomes of the OI process. Outcomes of contests are not always of disruptive nature, and their value is difficult to assess due to their intangible nature. Many suggestions from the public may simply lead to increased transparency of otherwise not observable government practices: "One idea we implemented made a process transparent that already existed in HR." Other benefits include indirect advantages that may solve the gap between citizens and government officials and ultimately lead to increased trust, simply by allowing a more open and participatory process. One

interview partner noted, “I think people had the feeling that it was government vs. them. Them being the citizens. We are bringing the wall—the firewall—down, but we are bringing it down brick-by-brick to directly communicate to the administration and have government communicate back to them.”

OI processes aim to increase both employee and citizen motivation knowing that decision makers value their ideas. Previous legacy systems—for both citizen and employee ideas were nonresponsive. There was rarely a tracking number or a direct feedback to help submitters understand what changes were implemented as a result of their input. One public manager says, “The suggestion box was a black hole. You never really know where the idea went, or even if it got looked at. OI allows you to see where your idea is, see who is weighing in on it, see what kind of feedback you are getting, if people think it is not a good idea, and you can ask why.”

The process can lower the burden on government decision making: Public citizen votes and comments help to increase inclusiveness perceptions and an understanding of how popular their submitted ideas are among other citizens and it releases government organizations from the obligation to respond to or act on every submitted idea. An idea that is supported by many might in turn lead to changes in policy. These policies with a lot of initial support in the draft phase can receive higher support than policy changes that were decided behind closed doors. Seemingly unpopular policies gain support before they are implemented.

Another important outcome of OI processes is increased inclusiveness. In comparison to time-bound face-to-face town hall or council meetings, online OI approaches have the potential to reach broader parts of the population. One public manager reports, “It’s highly successful, because we have reached more people than we normally would have if we did it the old way.” Using outreach mechanisms such as RSS feeds, Facebook, and Twitter links helps to draw in citizens to check if their ideas received comments or votes. Overall, there is the potential that government organizations need to pay less to outsource solutions to their public management problems to contractors or consultants. While government agencies do not know upfront what the quality of the solutions are that will be submitted by citizens, or if they will receive valuable insights at all, one public manager claims: “Not everyone’s [idea] is going to be great, but if we get thousands of ideas and if we get 10% that work, we’re very successful.” As an indirect outcome, this means that government organizations themselves need to innovate less, outsource less to external professionals, and can potentially save money.

OI initiatives can lead to tangible organizational outcomes. Ideas solicited from citizen problem solvers lead to lower costs for idea implementation and especially additional recourses to realize the innovations. Public managers at one of the municipalities interviewed provided the following argumentation for cost and resource savings: “It’s an opportunity to educate our citizens. Much of them don’t fully understand new procedures and policies. We tend to get a lot of disgruntled citizens. A lot of time if you take the opportunity to educate them and let them know, they go ‘Oh, okay. I get it now.’ And that in itself, you can’t really put a value on that.”

Tangible outcomes for economic development can go beyond internal process improvements and instead focus on retention and attraction of businesses or other forms of economic development. One specific case stands out among the initiatives included in the sample: “I don’t know how innovative or new it is, but out of the crowdsourcing site, somebody suggested that we implement a technology incubator. And that caught wind of a hardware incubator organization that was looking for a home, and they found us. And within a month or so, our economic development folks found a little place to live and, in the doors next week.” This shows that OIs initiatives contribute to the economic health of a community and can go beyond service delivery improvements of government organizations.

The following Figure 1 summarizes the stages applied by OI initiatives included in this sample. The majority of OI processes only includes the initial idea generation stage and does not offer any insights into further stages or information about the final implementation of submitted ideas.

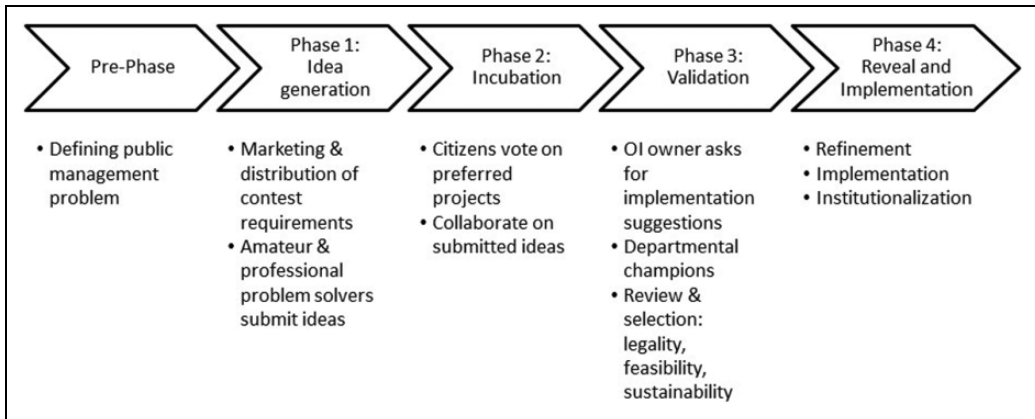


Figure 1. Open innovation phases in the public sector.

Discussion

Overall, OI approaches in the U.S. government are in its early stages and focus mostly on a wide range of crowdsourcing processes through which citizens are invited to generate and submit ideas to a government organization, oftentimes without a discrete public management problem to solve. Very few move from crowdsourcing to peer production approaches to tackle more complex tasks that might lead to innovations beyond simple design or process improvements.

Crowdsourcing of ideas as observed in this sample are mostly one-directional idea submission processes with no observable intention to implement the outcomes and no intention to cocreate or implement the innovation itself. Instead, the process in itself is seen as an outcome and enough to justify OI approaches in order to create new levels of citizen engagement. The indicator here is that there is no feedback beyond a submission confirmation (Phase 1). Subsequently, it is not surprising that the majority of the initiatives do not put a monetary value in form of price purse on the winning ideas and count on the willingness of citizens to help create a public good.

Higher levels of interaction occurred in only 5% of the cases included in this sample of U.S. government OI initiatives. Here, problem solvers are asked to go beyond a simple submission of an idea. Instead, they are asked to help select winning solutions by voting or commenting on the submissions and even helping to provide a proof of concept (Phase 2). Government organizations are moving the responsibility to favor a solution over another to the citizens with the goal to increase the acceptance of the implemented solutions. These small tasks conducted by citizens have the character of peer production processes, similar to small edits that many hands are conducting on Wikipedia or NASA's clickworkers, where the agency asks the public to review and identify small pieces of satellite pictures. Citizens are involved in the cocreation of the final solution, similar to feasibility tests and user testing approaches in the private sector. These value-oriented processes focus on designing an implementable solution and not just a mere collection of ideas.

Peer production and coproduction elements of OI approaches in the public sector highlight the importance of social interactions among problem solvers to improve and vote on the submitted ideas. Phase 2 is therefore characterized by its bidirectionality and interactivity among citizens and with government officials.

Phase 3 is very rarely directly observable on the sites included in this sample. While the interview partners provided insights how their agencies use some of the ideas, citizens are usually not involved in the implementation phase. True coproduction of innovation is not observable and responsibility for the implementation phase is solely left to government agencies, other than prominent examples,

Table 1. Summary of OI Process Elements.

	Phase 1	Phase 2	Phase 3
Phases	Idea solicitation	Incubation: Voting, commenting, and improvement	Validation and Implementation of OI outcomes
Approach	Crowdsourcing	Peer production	Coproduction
Prize money	Nonmonetary (Public recognition, public good, and learning) Monetary prize purse		
Crowd (problem solvers)	Employees only Citizens only No limitations		Government
OI outcomes	Public awareness, trust, accountability, increased inclusiveness, service delivery improvement	----->	New services, development economic development

Note. OI = open innovation.

such as CrimeWatch initiatives where both citizen volunteers and government officials producing the service together.

Contributions and Future Research

The following table 1 summarizes the current state of OI initiatives in the U.S. This analysis shows that simply implementing an innovative technology platform does not determine innovative organizational processes. Instead, procedural changes beyond the already existing suggestion box solicitation model are extremely rare and already existing processes are oftentimes simply digitized. Nevertheless, government agencies venturing out to implement OI approaches need to be seen as early experimentations that might lead to higher levels of innovation creation as agencies gain more experience. They provide opportunities to learn how to include citizens in the implementation and decision-making processes.

Future research needs to specify the concrete OI outcomes, which can go beyond physical or digital artifacts. Quantitative surveys of citizens are necessary to understand how public awareness has increased, whether citizens trust government more, and if government's accountability and openness has truly improved—beyond the perceptions of individual public managers interviewed in this study.

The managerial and cultural change aspects inside the bureaucracy need to be better understood to help gain insights into legal and institutional conditions, prerequisites, and barriers to embrace an OI approach. This exploratory study provides an overview of the design elements used in U.S.-based OI initiatives. While the geographic focus might seem limiting to some, the selected cases are valid in a specific political and legal system. Transferring OI practices into other countries requires an in-depth analysis of the legal context, for example, territorialization of government levels and responsibilities, local property right evaluations, and a legal investigation to what extent monetary incentives are allowable in government.

Additional research is needed to gain an in-depth understanding of the outcomes of OI initiatives in the public sector. As an example, do specific process design elements, such as peer voting or the request of a proof of concept, lead to higher-level innovation outcomes than simple crowdsourcing elements where the government is left to make the decision about the innovativeness of the

submitted solutions? Are government organizations only seeking government-specific innovations to solve internal public management problems or are common goods created that lead to innovations outside of government and might ultimately contribute to economic development opportunities?

In addition to design elements in different phases of the OI process, there is very little insight into the role of external problem solvers in public sector settings. Design elements can be adjusted based on sociodemographic factors of problem solvers who follow the call for action and donate their time and idea to create a public good. Are specific parts of an agency's constituency more prone to participate in nonmonetary contests and what type of problem solvers are attracted by larger prize purses?

These are questions that are outside the scope of this article, but are of critical importance for practitioners as well as academics to evaluate the design elements of OI processes.

Appendix

Overview of Crowdsourcing and Peer-production Initiatives in the U.S. Government

Table A1. Open Government Practices in the U.S. Government.

	Open innovation platform Codes	Level of government
1.	SeeClickFix	Local—city ^a
2.	DataSF Apps Showcase	Local—city
3.	NYC BigApps	Local—city
4.	Reinventnyc.gov Hackathon	Local—city
5.	iMesa (AZ)	Local—city
6.	MTA AppQuest	Local—city
7.	ICMA Conference 2013 Hackathon	Local—city
8.	NYC Simplicity	Local—city
9.	Apps4Democracy, DC	Local—city
10.	San Jose Wikiplanning	Local—city
11.	Maricopa County's Idea Factory	Local—county
12.	Idea Factory, Harford County	Local—county
13.	Broadbandvt.org, Vermont	State
14.	Next Stop Design Project	State
15.	Regulations.gov	Federal
16.	President's SAVE Award	Federal
17.	Regulations.gov	Federal
<i>(continued)</i>		

18.	We the People	Federal
19.	1940 U.S. Census Community Project	Federal
20.	Partner4Solutions	Federal
21.	“Did you feel it” Earth Tremors	Federal
22.	Peer-to-patent	Federal
23.	Challenge.gov	Federal

^aOriginally community-led, now transformed into business organization.

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Author Biography

Ines Mergel is an associate professor of Public Administration and International Affairs at Syracuse University's Maxwell School of Citizenship and Public Affairs, Syracuse, NY. For more information, please visit <http://faculty.maxwell.syr.edu/iamergel/>; email: iamergel@maxwell.syr.edu