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Citizen Participation, Open Innovation, and Crowdsourcing: Challenges and Opportunities for Planning

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Abstract

Open innovation, taken from the fields of business strategy and technology development, can offer planners fresh insights into their own practice. Open innovation, like citizen participation, goes outside the boundaries of the organization to find solutions to problems and to hand ideas off to partners. A key technique for open innovation is "crowdsourcing," issuing a challenge to a large and diverse group in hopes of arriving at new solutions more robust than those found inside the organization. The differences between citizen participation and Internet-based crowdsourcing are discussed. Crowdsourcing case studies are provided as a means for extending an emerging literature.

Keywords

citizen/public participation, planning practice, planning theory, applications/techniques

Introduction

Reaching out and engaging citizens and stakeholders is not just a fact of life for planners but a canon of good and ethical planning practice. Much like planners, practitioners of open innovation also reach out beyond the confines of their organization for ideas and solutions, for the innovations that will enable their organization to excel. Open innovation is a concept that comes from the business strategy and innovation literatures, and refers to the conscious effort by firms to incorporate ideas originating outside the firm in innovation processes within the firm, or to send internally created ideas outside of the firm for commercial application.

We believe that planners can glean new insights for their practice from the emerging literature on the theory and methods of open innovation. We also believe that practitioners of open innovation can learn a lot from the experience that planners have had with boundary-spanning practices going back to the establishment of the planning profession in the United States more than 100 years ago.

This article is presented in an effort to encourage a cross-disciplinary dialogue between planners and those engaged in innovation processes in other sectors. Though the aims for and requirements of citizen participation and open innovation do not always align perfectly, as we will make clear below, we do believe that greater appreciation of the experience and views coming from the respective communities will be beneficial to both.

This article is presented in six parts. We start with a discussion of citizen participation, focusing on purposes and expectations. That leads us to open innovation and to one of its key techniques, "crowdsourcing," issuing a challenge to a large and diverse group in hopes of arriving at new solutions more robust than those found inside the organization. Next, we look at the very limited but emerging literature on crowdsourcing in planning, and to our augmentation of that literature with the presentation of cases of the application of crowdsourcing as a technique for enabling participation in planning and public policy making. We conclude with a discussion of the differences and similarities between public participation in planning and open innovation carried out through crowdsourcing processes, along with final thoughts about the topics presented here.

Citizen Participation

Involving citizens in making plans is a cornerstone for good planning practice. This is not a new idea. Schweizer, writing in 1949 about planning in postwar Germany, connected the democratization of planning with the emergence of democratic forms of governance. Roberts (2004) notes that though citizen participation has a long history in the United States, the publication of Arnstein's "A Ladder of Citizen Participation" in 1969, the passage of the National Environmental Policy Act

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in 1969, and the Federal Advisory Committee Act of 1972, marked the emergence of the systematic and institutional incorporation of citizen involvement in local, regional, and state planning.

The American Institute of Certified Planners (AICP 2009) ''Code of Ethics and Professional Conduct'' is prefaced with the statement that the code is derived ''from the special responsibility of our profession to serve the public interest with compassion for the welfare of all people . . . '' and with a ''primary obligation'' to serve the public interest, planners shall aspire to ''. . . give people the opportunity to have a meaningful impact on the development of plans and programs that may affect them.''

In a review of citizen participation in planning, Lane (2005) traces the evolution of the concept in concert with emerging ideas about planning itself. Lane found that:

1. All schools of thought regarding the nature of planning and the role for citizens in planning processes recognize the political nature of planning, and the consequent requirement for active citizen involvement;
2. The emergence of a pluralistic view of society is an important development for understanding citizen involvement, particularly given a more homogeneous view embodied in earlier work; and
3. Today all schools of thought about planning regard citizen involvement as a fundamental characteristic of the planning process, not just an adjunct to decision making.

According to Lane, citizen participation is not just one thing, one practice, associated generally with planning. Rather, citizen participation, in this context, is a variety of approaches and practices associated with key decisions and judgments entered into from the moment that a planning problem is conceived.

Probably, the most active territory for planning theorizing today is ''communicative planning,'' associated closely with collaborative processes involving a wide range of stakeholders. Healey (2003, 2006) notes that communicative planning theory recognizes that all forms of knowledge are socially constructed, and that those processes for constructing knowledge are inherently political. Collaboration between all participants in the process—citizens, planners, and decision makers—is the process and context within which plans are made. Plans emerge from the interaction of participants, and it is incumbent on planners to ensure that power relations are known and anticipated in the design of the participatory elements of the planning process.

Brand and Gaffikin (2007) note that collaborative planning tends toward ''negotiated consensus'' and that the planner's role is to create a forum where ''non-hostile discourse among equals'' can take place. If successful, planners would not only be engaged in one-way knowledge transfer, but a two-way knowledge exchange. Margerum (2002) identifies the obstacles to stakeholder participation and the ways that planners can anticipate barriers to effective collaborative planning activities.

Innes, Connick, and Booher (2007) take the concept of collaboration further, demonstrating that it works through a network, rather than a hierarchical structure, relying both on formal relations within institutions and informal relations in community. Innes and Booher (2010) identify a process of ''collaborative rationality'' that describes the products and benefits of face-to-face dialogue and engagement within the planning process. Echoing the literature on participation, they also associate the best prospects for plan adoption and success with processes where all participants are fully informed and able to both inform and affect outcomes.

When it comes to collaboration in planning, scale matters. In the United States, regional planning is marked by an absence of effective institutions operating at the scale of the region (Seltzer and Carbonell 2011). McKinney and Johnson (2009) identify the unique challenges for planners seeking collaboration at the regional scale. They describe the ''governance gap'' that exists when there are no institutions charged with dealing with transboundary issues, and a ''continuum of regional collaboration'' that extends from networks to partnerships to regional institutions, with most activity never achieving the development of institutions whose scale and territory of concern match the scale of the issues under consideration. Almost paradoxically, the lack of region-scale institutions requires a willingness to engage people and interests at the most local levels. They find that there is no generalizable model and that efforts to bridge the governance gap are entirely context-dependent.

The purposes for citizen participation in planning, following Lane, have largely to do with how the planning itself is both theorized and what it is being asked to accomplish. The fact that planning, however theorized, includes participation, and that the norms of good practice as reflected by the AICP code expect affected citizens to be engaged suggests that seeking ideas, information, and engagement from outside the planning agency describes not just a normative position but a fundamental aspect of what we regard as ''planning'' today. Planners and planning processes look beyond the confines of their own organizations in order to construct plans. Or, planning cannot take place, as currently conceived, in the absence of citizen involvement.

Indeed, the purposes for citizen involvement in planning are often described in terms that reflect the contingent nature of plans. Those affected by plans should be engaged in making them. Planners need information not ordinarily available to external actors. Plan implementation rests on the degree to which citizens view plans as a legitimate basis for taking action and invoking public purposes to directly affect private property and decision making.

An additional purpose for citizen participation can be derived from nonlinear approaches to planning theory. Hwang (1996) noted that viewing the world as being composed of intersecting nonlinear systems calls forth a focus on process and relationships. The very unpredictability of the interactions in nonlinear systems necessitates a robust set of external relations in order to cope with the inevitable uncertainty of the

future. Framed another way, resilience is found in planning through the incorporation of a wide range of views, since no single or limited point of view could possibly provide the insights needed to cope with what may come next. Burby (2003, 33), echoing Hwang, notes that, ''Strong plans stem from planning processes that involve a broad array of stakeholders, and strong plans accompanied by broad stakeholder involvement are needed if plans are to have a significant effect on the actions of local governments.'' He identifies the things that planners can do to encourage the kind of robust involvement needed to make good plans, but concludes that though the importance of seeking involvement is clear, planner resistance to seeking it is remarkable.

Writing about the origin of ''good'' ideas, Steven Johnson (2010, 22) notes that ''. . . we are often better served by *connecting* ideas than we are by protecting them . . . Good ideas may not want to be free, but they do want to connect, fuse, recombine. They want to reinvent themselves by crossing conceptual borders. They want to complete each other as much as they want to compete.''

Johnson proposes that progress most often comes from the relentless probing of what can be done with combining and recombining what is known, something he calls the ''adjacent possible.'' He writes, ''Good ideas are not conjured out of thin air; they are built out of a collection of existing parts, the composition of which expands (and, occasionally, contracts) over time'' (Johnson 2010, 35).

As with citizen participation, Johnson's good ideas come not from sitting ''around in glorious isolation,'' but from bringing more ideas into the mix. And, like the collaborative planning theorists, good ideas emerge from networks. In this regard, Johnson likens the metropolis to the Internet and points to both as ''places'' where the connections between ideas can flourish. He notes that ''chance favors the connected mind,'' and, connecting place and practice in ways familiar to planners, concludes:

> The patterns are simple, but followed together, they make for a whole that is wiser than the sum of its parts. Go for a walk; cultivate hunches; write everything down, but keep your folders messy; embrace serendipity; make generative mistakes; take on multiple hobbies; frequent coffeehouses and other liquid networks; follow the links; let others build on your ideas; borrow, recycle, reinvent. Build a tangled bank. (Johnson 2010, 246)

In recent years, planners, like nearly everyone else, have gravitated to the Internet and its wide and asynchronous reach as a means to engage an even broader group of stakeholders (Evans and Mathur 2005; Evans-Cowley 2010a, 2010b; Evans-Cowley and Hollander 2010). Here, web-based participation is seen not so much as a replacement for traditional approaches to involvement, but as a complement. Mandarano, Meenar, and Steins (2010) investigate the links between web-based participation and the development of social capital, and point toward the need for mixed methods, some web-based and some not. They also point out that this entire area of inquiry is new, with a literature offering few formal evaluations and raising more questions than it answers.

This emerging literature, often labeled as ''eParticipation,'' is part of the much larger ''eGov'' discussion. Velikanov (2010), in the spirit of the collaborative planning literature, distinguishes between online forums that allow themes to proliferate rather than those that are designed to bring opposing views together, aiming for a convergence or crystallized view. He states that only the latter can be considered a collaborative model.

Nash (2009) urges planners to embrace ''Web 2.0,'' where user/participants are not just consumers of web-based content but producers of content as well, as the best and possibly only means for improving the transfer of information from the public to planners, and for realizing the promise of and responsibility for citizen involvement, in this case in transportation planning. He recommends that planners make data easily available, encourage developers outside the organization to use the data and create applications, to create applications that collect public knowledge and expertise in a collaborative process, and to fully commit to making an attractive, engaging web-based portal a high priority, both initially and over time.

However, the move to the digital world, while of great interest for tapping into the fervor for all things smart and literally at hand, raises interesting issues for planners. In particular, how does online participation relate to the four primary purposes for participation identified here: identification and collection of data known best or only to community members, establishment of legitimacy for the planning effort due to its development in consultation with key stakeholders and community members, addressing the ethical and moral commitment of planners to ensuring that those most directly affected by a plan have a hand in making it, and the development of robustness by bringing the broadest possible set of views to the table in the process of plan making. It is to that question and ideas from the field of open innovation to which we now turn.

Open Innovation

Planning is not the only enterprise for which participation by a larger public is a cornerstone for good practice. What has been described as ''open innovation,'' a concept coming from the innovation and business strategy fields, utilizes very similar language to that found in the citizen involvement and collaborative planning literature. In the broadest sense, open innovation, like citizen participation, seeks involvement on the part of users, customers, and ''thinkers'' as a means for augmenting the perspectives found inside the firm or organization.

Gassmann and Enkel (2004) define open innovation as the cooperative creation of ideas and applications outside of the boundaries of any single firm. They identify three ''open innovation process archetypes'':

- Outside-in . . . enriching the company's own knowledge base through the integration of suppliers, customers, and external knowledge sourcing in internal innovation and knowledge creation processes
- Inside-out . . . providing new ideas coming from sources of knowledge and innovation internal to the firm to external users in the outside environment
- Coupled . . . coupling outside-in and inside-out approaches in alliances with partners

Chesbrough (2004) contrasts open innovation—that firms should use external ideas and paths to markets as well as internally generated ideas and internally controlled paths to markets—with closed innovation—companies must generate their own ideas and commercialize them themselves. He notes that closed innovation, particularly in industries like information technology having a rapid cycle time, is no longer sustainable and requires a kind of control that is no longer available or predictable. He suggests that in the past, companies could liken their innovation and product development to a game of chess. In this environment, one characterized by uncertainty in markets and resources and a continuous deluge of new information, companies must learn to play poker, "showing their cards" as a means for revealing new opportunities.

Expanding on this work, Chesbrough and Appleyard (2007) propose that companies go from open innovation to practicing what they call "open strategy." Open strategy recognizes the need to balance open innovation with the requirement that firms turn a profit. In their words, it means striking a balance between value creation and value capture. They point to open innovation as dependent on the "users," those outside the firm willing to participate in the innovation process, and user contributions amounting to both new ideas and, with a large number of users, built-in momentum behind new products. Chesbrough and Appleyard go on to identify four challenges for effectively managing open innovation processes in this context:

- –attracting participation from a broad group and sustaining it over time;
- –effectively competing for contributors in a world with a limited supply;
- –effectively setting the tone and expectations for the meaning of involvement on the part of users through careful leadership and agenda formation; and
- –finding ways to profit from activities carried out in an open environment. (Chesbrough and Appleyard 2007, 68)

Here, read "users," those identified by Chesbrough and Appleyard as being outside of the firm, as "citizens" and the products emerging from the open innovation projects they talk about as "plans," and there is an interesting and compelling link to the participation literature. Attracting and retaining a diverse group of citizen participants is an ongoing challenge for planner, especially since citizen involvement is most often a leisure-time activity for most citizens and must compete with a range of other ways for citizens to spend their time. Exercising leadership and making decisions can and usually does become complicated and contentious, particularly in the political environment from which plans emerge. Although planning and public policy usually do not have profit as a metric for success, election and reelection are a function of how these processes work, and whether all interests were seen to have been treated fairly. More to the point, that balance between value and creation and value capture sought by firms and private sector managers engaged in product development can be seen as directly analogous to the legitimacy purposes served by citizen involvement and essential to not just planning but successful implementation.

In fact, in open innovation processes that were sustained over time, the participants as a group, both internal and external, began to take on characteristics of communities. Paulini, Maher, and Murty (2011), in a case study of design processes used by the company Quirky, found that social communication became important in establishing credibility, even more so than strict qualifications. In fact, social communication turned out to be a large proportion of all communication among participants. Rapport built up among participants over time, and as in any community, communication did not follow a linear, synchronous path.

Of course, getting people from outside of the organization to participate is, as Chesbrough and Appleyard point out, never easy. Monetary rewards help, but for planners and others engaged in developing public policy, monetary rewards are almost never possible. Defining problems for others to solve, particularly those only loosely associated with the organization or firm, is a challenge. Speidel (2011) suggests that resistance can be overcome if:

- –organizations describe what they want but not how to get it. You want people to think about the problem, not how you think about the problem;
- –the context for the problem is carefully described so that potential "solvers" can understand the right problem to be solved;
- –concepts get defined and are not assumed to be known;
- –organizations seeking open problem solving are clear about what they won't be able to do;
- –all that is known is shared; and
- –a "values" orientation is used to describe the qualities being sought in terms that mean something to all.

Martino and Bartolone (2011) describe the skills needed by those in organizations tasked with managing open innovation processes. In their view, similar to the notion put forth by Brand and Gafikin (2007) for the role of the planner, these professionals need to be intrapreneurial, working to make the process as appealing inside the organization as out, good communicators, have a talent for relationship building and maintenance, a quick study, and have a high tolerance for uncertainty and passion while maintaining optimism for the work. Loren (2011) suggests that open innovation can be implemented using one or a combination of strategies:

- –contracting or paying for work
- –interacting among units found within a multidisciplinary firm or campus
- –utilizing a combination of internally and externally generated ideas
- –partnering with or even paying key customers to generate ideas
- –partnering with suppliers
- –growing an ecosystem of partners utilizing suppliers, customers, and other external but interested parties
- –creating an internal market for ideas within the organization but outside the work group
- –crowdsourcing, or the issuance of a challenge to a group of experts and nonexperts found outside the organization, using an Internet-based platform.

From a planning and public policy point of view, it is this last strategy, crowdsourcing, that may have the most direct application in relation to a desire for robust citizen involvement.

Crowdsourcing

The term "crowdsourcing" is usually identified with a series of articles written by Jeffrey Howe in *Wired* magazine (2006) and his subsequent book on the topic (2009). In his 2006 article, Howe chronicled the rise of what he identified as a countercurrent to the outsourcing of problem solving to firms in India and China. That countercurrent tapped into the untapped wisdom and talents of people in many places, including the United States. Howe's article told the stories of four kinds of problems addressed by different individuals and groups in response to a range of problems or opportunities put forth by or on behalf of end users, and christened it crowdsourcing, literally finding what you need not internally or from traditional vendors, but from people loosely affiliated through the Internet.

Zhao and Zhu (2012), in their evaluation of research on crowdsourcing, distinguished crowdsourcing from open innovation generally and open source code development more specifically by noting that crowdsourcing was not "open," but instead relied on individual and independent work. They also presented it as different than outsourcing because of the lack of control over the crowd on the part of the issuer of the challenge. They define crowdsourcing as a "collective intelligence system" characterized by three components: an organization that directly benefits from the work of the crowd, the crowd itself, and finally a platform able to link the two together and to provide a host for the activity throughout its lifecycle.

Aitamurto, Leiponen, and Tee (2011) identify crowdsourcing as an open innovation mechanism based on and enabled by information and communication technologies. They note that the term "crowdsourcing" itself continues to be debated, particularly in relation to other concepts like cocreation and user innovation. Echoing Johnson, they find that a community-based, crowdsourced approach is best used when innovations are based on past advances. They suggest that instead of collaborative community-based approaches, competitive market-based approaches, those relying more on competition among participants for creating the "best" solution, are best when widespread and parallel experimentation is needed.

They find that crowdsourcing can be problematic when the problem sent to the crowd is poorly defined, and when feedback enabling the crowd to better fit solutions to needs is poor to nonexistent. Crowdsourcing is not a one-time action, and requires ongoing stewardship, and they note that, ". . . crowdsourcing can be both economically and intellectually (providing long-term unquantifiable benefits) fruitful activity, but firms may need to be realistic about what types of problems and users they can feasibly engage, and what capabilities they have or need to manage the community and its expectations." (Aitamurto et al. 2011, 23) In general, they report, crowdsourcing is most applicable to problems where needed expertise and knowledge are distant from the firm.

Zheng, Li, and Hou (2011) and Leimeister et al. (2009) both find that motivation for participation in crowdsourcing is a mix of intrinsic and extrinsic factors. Extrinsic factors include the availability of compensation and the prospect for public recognition. Intrinsic factors are associated with the needs and desires found within the individual, similar to the desire to engage in a hobby. They both report that compensation is far less important than either the prospect for public recognition or the satisfaction of internal desires. Zheng et al. go further and suggest that good practice should anticipate the power of public recognition as a major motivator. They also suggest that crowdsourcing activities should utilize online platforms that are designed to enable communication between sponsors and solvers, and enable the growth of online communities, and that challenges should rely on very well-defined problems that allow solvers to work independently and with the clear prospect of being able to "compete" without depending on an extraordinary amount of tacit knowledge.

Brabham (2008a) describes crowdsourcing as a web-based business model that utilizes an open call to glean innovative solutions to firm problems or needs. He notes that crowdsourcing is a strategic model that enables firms to move faster and more efficiently to generate new products or to solve complicated problems. Here, the Internet is essential for allowing people from around the world to interact in ways previously impossible.

Brabham (2010) asserts that crowdsourcing should be viewed as a means for quickly aggregating rather than averaging solutions:

> The crowd's strength lies in its composite or aggregate of ideas, rather than in a collaboration of ideas. . . . This 'wisdom of crowds' is derived not from averaging solutions, but from aggregating them. (Brabham 2010, 1125)

He notes that understanding the motivations for participation are crucial when designing a crowdsourcing call, but that there is no single set of motivations that work for all crowdsourcing actions. He identifies love of and commitment to community, desire to make money, opportunity to develop skills, the challenge, the opportunity to advance one's status among

peers, fun, and something to do when bored as among the reasons that people might willingly engage in crowdsourcing.

Though a clear fan of crowdsourcing, Brabham (2011) also cautions that it requires a robust, motivated, active crowd, a lot of transparency on the part of the sponsor, and that it can be manipulated and gamed easily due to the ease of access and the anonymity afforded to participants. Though useful, he suggests that crowdsourcing should not be used as a replacement for other forms of engagement or innovation, particularly on the part of government, noting that representation cannot be assured, the activity can be easily co-opted by elites having better access, and that it favors the organization at the expense of the laborer.

Congruent with these concerns, Schenk and Guittard (2009) considered crowdsourcing not as something new and novel, but as a form of outsourcing. They view crowdsourcing as primarily a firm-centered activity, in contrast with "user innovation." Crowdsourcing differs from user innovation in that crowdsourcing attempts to draw from everyone, user and nonuser alike, whereas user innovation is really an effort by users to better meet their own needs.

Howe built on his earlier observations in a book on the topic that appeared in 2009, where he asserted that crowdsourcing could be used to solve any kind of problem. He noted that, "Some professionals rightly regard crowdsourcing as a threat; others, likewise, view it as a solution. In fact it is both" (Howe 2009, x). In Howe's (2009, 134) crowdsourcing, diversity trumps ability:

> Crowdsourcing is rooted in a fundamentally egalitarian principle: every individual possesses some knowledge or talent that some other individual will find valuable. In the broadest terms, crowdsourcing involves making a connection between the two. . . . we are all the raw stuff of circumstance. . . When uniqueness persists in large groups, we call it diversity.

Here, consensus is viewed as counterproductive. More important is the insight and information that can be accumulated via a network, not through refined and constrained expertise.

This view builds off the earlier work of Surowiecki (2005) and what he called the "wisdom of the crowd." Surowiecki found that ". . . under the right circumstances, groups are remarkably intelligent, and are often smarter than the smartest people in them" (p. xiii). That is, innovative solutions to problems could be found within diverse, decentralized and independent crowds, which include acknowledged experts as well as those with no formal expertise. The best decisions were not the product of consensus and compromise, but of disagreement and context. In essence, and echoing Hwang (1996), gathering in the widest possible number of views, expert or not, could result in new combinations of ideas that would yield unexpected and profoundly wise outcomes.

This finding is supported by other authors. For example, Poetz and Schreier (2012) explicitly studied the value of user versus professional ideas emerging in a crowdsourced new product development process. They found, perhaps counterintuitively, that user ideas were not just as novel or innovative as expert ideas, they were often just as feasible, too, and that crowdsourcing, drawing on the wisdom of the crowd, could be a useful complement to other elements of traditional new product development processes. Lakhani et al. (2007, 12–13), in a study of scientific problem solving, found similar results:

> Our most counter-intuitive finding was the positive and significant impact of the self-assessed distance between the problem and the solver's field of expertise on the probability of creating a winning solution. . . . We reason that the significance of this effect may be due to the ability of "outsiders" from relatively distant fields to see problems with fresh eyes and apply solutions that are novel to the problem domain but well known and understood by them. . . . as our results suggest, opening up the scientific problem solving process can yield innovative technical solutions, increase the probability of success in science programs and ultimately boost research productivity.

That said, Roman (2009) cautions that crowdsourcing, rather than automatically yielding higher, better forms of knowledge, can also empower followers at the expense of leaders or experts. That is, simply putting the question out there is not nearly enough.

One answer to this may be found in what Surowiecki identified as three conditions required for wisdom: diversity among members of the crowd, independent thought on the part of the actors, and decentralization in the organization of the activity. He contrasted wisdom emerging from crowds operating according to these conditions with "groupthink," the tendency for nondiverse, nonindependent, hierarchically organized groups to follow the lead of those with the greatest status in the group. Even if individual members had contrary or novel positions, they would be unlikely to voice them due to the fact that taking a position or idea counter to the conventional wisdom could jeopardize their standing within the group. To Surowiecki (2005, 57), "Collective decisions are likely to be good ones when they're made by people with diverse opinions reaching independent conclusions, relying primarily on their private information."

This conclusion is supported by Cain (2012) who notes that brainstorming can too easily lead to a kind of groupthink which excludes rather than elicits good ideas. Her topic is the need for solitude and the important creative work conducted by individuals. She reports on research documenting the pitfalls of brainstorming and collaborative group work, but notes that, ". . . the one important exception to this dismal record is electronic brainstorming, where large groups outperform individuals, and the larger the group the better. The protection of the screen mitigates many problems of group work. This is why the Internet has yielded such wondrous collective creations. Marcel Proust called reading a "miracle of communication in the midst of solitude," and that's what the Internet is, too. It's a place

where we can be alone together—and this is precisely what gives it power.''

None of Surowiecki's three conditions is easy to meet. Ensuring diversity is key, but reaching and connecting a truly diverse group means finding a multiplicity of ways to reach people where they are. Not everyone has a landline. Not everyone is comfortable in or has access to the digital world. Independent thought, desirable as it is, is hard to achieve given both the power relations in society and in groups, and the desire to connect. Consider the results of Paulini et al., reported above, in their study of the predominance of social networking and communication in and around design processes, a direct challenge to the ''independence'' condition reported by Surowiecki. Finally, decentralization is a particularly challenging notion. Enabling ideas to move to all corners of the crowd in the absence of some central organization is difficult. In fact, Surowiecki suggests that decentralization works only when everyone participates, a very tough condition to satisfy.

From a public policy point of view, Surowiecki (2005, 271) identifies democracy as being most likely to enable the wisdom of crowds to emerge:

> . . . this is how we might think of democracy. . . it is a way of dealing with (if not solving once and for all) the most fundamental problems of cooperation and coordination: How do we live together? How can living together work to our mutual benefit? Democracy helps people answer those questions because the democratic experience is an experience of not getting everything you want. . . . . a healthy democracy inculcates the virtues of compromise–which is, after all, the foundation of the social contract–and change. The decisions that democracies make may not demonstrate the wisdom of the crowd. The decision to make them democratically does.

Here, as in the participation literature, collective judgment will be wise if the group is diverse, people cannot influence each other too much, the net is cast wide, and something akin to a democratic process is used to sort out the good ideas from the less good or bad. Under these conditions, Surowiecki posits that the individual mistakes made by group members will be irrelevant in the scope and scale of the final collective result. Howe (2009) reports on ''Sturgeon's Law,'' which posits that 90 percent of user-generated content is useless or worse and that idea generation via crowdsourcing follows the 1:10:89 rule—for every 100 people participating on a website, one will generate something useful, 10 will engage in refining and promoting the idea, and 89 will passively consume.

Howe (2009) provides ten ''rules'' for creating useful, valid crowdsourcing actions:

1. Pick the right model. Crowdsourcing comes in several forms—collective intelligence/crowd wisdom, crowd creation, crowd voting, crowdfunding, or some combination—and it is essential that the form fits the purposes.
2. Pick the right crowd. Cultivating, stewarding, and sustaining the crowd is essential. Crowdsourcing is not a one-shot activity, but requires iterative participation to get to a wise solution.
3. Offer the right incentives. Match the incentives to the desired product.
4. Keep the pink slips in the drawer. Don't view crowdsourcing as a means for replacing expensive, in-house labor with free or cheap crowd labor. Crowdsourcing needs capacity inside the organization to lead and shape the crowd effort.
5. There needs to be a benevolent dictator to act as decider, to call an end to the activity.
6. Keep it simple and break it down into easily understandable parts. Defining the problem right and crafting the call well are both essential.
7. Remember Sturgeon's law.
8. Remember the 10 percent that act to make the output of the 1 percent useful, and find ways to encourage them.
9. The community is always right. The power of the decider is moral and persuasive, not absolute.
10. Ask not what the crowd can do for you, but what you can do for the crowd. You must give the crowd something it wants or it won't participate. Interestingly, Archak and Sundarajan (2009), writing on the ''Optimal Design of Crowdsourcing Contests,'' go so far as to develop mathematical rules for ''prizes,'' stating that, ''. . . each new prize should have approximately twice higher marginal utility than the prize immediately above it. Once we reach a point at which it is not possible to satisfy this relationship, no new prizes should be awarded.'' (Archak and Sundarajan 2009, 14)

In essence, define the problem well, create and steward a diverse, heterogeneous crowd, and make participation worthwhile for the participants. Crowdsourcing may be a cheaper and more nimble method for product development, but it is not a substitute for other, more formal channels and it is not free for the sponsoring organization. Resource commitments need to be made up-front and ongoing.

Crowdsourcing and Planning

Although crowdsourcing and open innovation are largely associated with private sector innovation processes, that is changing rapidly as new applications are being made in communities for community purposes. When the context changes from firms engaged in open innovation processes to planners engaged in citizen participation efforts, it is useful to keep several things in mind:

1. Firms and planning agencies are not the same thing. What makes the open innovation model relevant to planning, however, is the notion that both processes look beyond the confines of the sponsoring entity. Framed another way, Alexander (1993) suggests that planning can be viewed as a coordination problem among numerous institutional and other interests, both for making plans and subsequent

plan implementation. Planning is portrayed as a network-based activity, much as open innovation pursued through crowdsourcing is portrayed as a means for engaging a diverse and heretofore diffuse crowd and the knowledge and creativity of crowd "members."

2. Citizen Participation and crowdsourcing share some but not all of the same aims. Both seek greater robustness. Both seek information and insights that only members of the crowd possess. However, crowdsourcing does not rely on the attitudes of any but the sponsors for conferring legitimacy on solutions. Further, whereas citizen participation is expected to give voice to those most affected by plans and planning decisions, and to provide a means for those likely to be excluded, intentionally or not, from making plans, crowdsourcing has no such brief.
3. By depending on a well-developed problem statement, crowdsourcing as a technique can arise in direct conflict with the expectation that citizen participation is, in fact, the process through which problems are identified, visions crafted, and goals and objectives specified. This is not so much a disqualification of crowdsourcing as a vehicle for citizen participation, but a caution that it is good for addressing some but not all requirements for citizen participation in planning. When there is a well-defined problem in need of solving, and the expertise of planners and institutions could benefit from engaging a creative and motivated crowd, then crowdsourcing makes sense. When, however, the purposes and aims for planning remain vague, crowdsourcing may be more manipulative than constructive.

Actual formal applications and assessments of crowdsourcing in public planning activities are still hard to find. Though there is a quickly growing and parallel literature on the use of various Internet and non-Internet-based information and communication technologies in planning, Zhao and Zhu (2012), in a systematic review of the literature addressing crowdsourcing and related concepts, found that the literature available to date can only be regarded as preliminary and as evidence of an emerging rather than established field of inquiry. Mandarano et al. (2010) have provided an extensive review of the literature available on the use of these technologies for building social capital and similarly conclude that the literature raises more questions than it answers. As noted above, Evans-Cowley (2010a, 2010b) and Evans-Cowley and Hollander (2010) have written about the incorporation of these technologies in citizen involvement activities, finding that online technologies are good for meeting some but not all objectives for participation, and that the actual impact of new technologies, particularly mobile technologies on individuals, communities, and cities is still unfolding.

Evans-Cowley (2011, 3), writing about the use of crowdsourcing for redesigning the planning curriculum in her university, notes that:

> City and regional planning is a perfect discipline for crowdsourcing because planners are constantly identifying problems and working to find solutions. Planners excel in framing problems and soliciting input from the public, and they intuitively recognize the power (of) the public to solve problems as a group.

She identifies crowdsourcing as a means for surveying the public in a manner that allows them to see the ideas as they are put forth, thereby increasing the transparency of the surveying process. Here, the fact that a survey is carried out via an Internet-based platform among a large "crowd" is equated with crowdsourcing, an application of that concept more apparent in form than substance. In her project, she noted a number of critical issues that planners will need to address should they choose to proceed with crowdsourcing:

- Digital divide: unequal access to the on-line world remains an important problem for public agencies.
- Need for high bandwidth: speed matters for both the user experience and the ability to fully participate.
- Technical support must be anticipated for both sponsors and participants.
- Cost: crowdsourcing, as noted above, is not free and requires time, money, and other commitments.
- Consistent with the crowdsourcing literature, getting people to visit/interact more than once is a challenge and necessity.
- Representativeness: she found a need for logins as a means for determining who in the community was speaking.
- Users need consistent and ongoing feedback regarding what was happening and how it was being used.
- The problems must be very well-defined for crowdsourcing to be used appropriately and usefully.
- The role for planner expertise becomes a little ambiguous. When is designing the process equivalent to leading the planning? What else happens around the crowdsourcing activity to utilize the skills and perspectives of planners, and how is that made apparent and related to the crowdsourcing?
- Decision making is a separate activity, different than but occurring in relation to the crowdsourcing.
- Crowdsourding can easily generate more info/responses than can be dealt with.

Brabham (2009) directly addresses the potential benefits to planning of seeking public participation generally through crowdsourcing. He proposes that planners should seek the "latent talent" of the community via the Internet and crowdsourcing:

> The medium of the Web enables us to harness collective intellect among a population in ways face-to-face planning meetings cannot. As open source production on the Web has proven itself as a collaborative method for designing superior software products, the crowdsourcing model may prove itself as a superior method for designing real spaces, planning the built environment. I argue that the crowdsourcing model, a successful, Web-based, distributed problem solving and production model for business, is an appropriate model for enabling the citizen

> participation process in public planning projects. (Brabham 2009, 244)

Here, the success in the business world of activating and tapping the wisdom of the crowd for product development and problem-solving purposes is seen to be transferable to public planning activities, and in particular, to augmenting citizen involvement in planning. Brabham notes that the digital divide may be a problem, but that using the web, either via crowdsourcing or other avenues, recognizes how citizens actually engage democracies today. Though he notes that the City needs to define and clarify the problem to be addressed, little is said about steps taken to identify or nurture the crowd, or for the roles that elected leaders, appointees, and planners would need to play to make the crowdsourcing activity both successful and free from the problems associated with poorly understood and managed crowds.

Brabham, Sanchez, and Bartholomew (2009) write specifically about the application of crowdsourcing to what they call transit planning. In actual fact, they provide a case study of crowdsourcing used to design a bus stop shelter, not for planning a transit system or its operation. They view crowdsourcing as both drawing in a more diverse crowd of participants than would be typically be found in a citizen involvement effort, and giving voice to citizens not able to participate as freely or openly as others. They reiterate the notion that crowdsourcing enables the aggregation rather than averaging of ideas, noting that:

> . . . the key to aggregating instead of averaging ideas is to allow individuals to develop complete single ideas and put them up for review among their peers in the crowd. Easily, the crowd can sift through the bad ideas to find the good ones, a sorting that could be accomplished with a simple online voting scale. . . . Aggregating the single ideas of individuals in the crowd by putting them in competition with one another does not mean the disappearance of qualitative input. Planning decisions are not about the will of the simple majority. . . . Ideally, individuals in the wise crowd incorporate discussion and exchange as they develop potentially a series of individual solutions to contribute to a commons. . . . The process is not unlike peer review. This is also different from the deliberative democratic model, which favors compromise and debate to produce collective, averaged solutions. (Brabham, Sanchez, and Bartholomew 2009, 4)

Though they note that the most important piece of "infrastructure" for crowdsourcing is a "vibrant and engaged online community," no details are given regarding how such communities can be developed and stewarded, what the cost is or was to the sponsoring agencies, or how quality was recognized and selected. Still, this represents one of the first attempts to consciously apply crowdsourcing, as described in the literature, to a public design process.

Emerging Cases

To augment this emerging rather than established literature on crowdsourcing in planning, we used the existing literature, the Internet and news searches, and suggestions from key informants to identify a list of twenty-four examples of crowdsourcing (see Appendix). Some of the cases (e.g., Threadless, InnoCentive) are favorites in the crowdsourcing literature and are used by both Daren Brabham and Jeff Howe in multiple publications (Brabham 2008b, 2009, 2010; Howe 2006, 2009; Schenk and Guittard 2009). They are also among the oldest, most popular and most successful examples of crowdsourcing (Brabham 2009). Some case studies found through active Internet and social media searches do not appear frequently in the academic literature, or use crowdsourcing in the public sector, or a combination of the two (e.g., Neighborland, IdeasProject).

Both colleagues and others interested in this work sent additional cases as potential examples for inclusion in our assessment (e.g., CarrotMob, Victor & Spoils). Our aim was to combine both established cases with newer cases, particularly in the public sector, to inform our understanding of the contemporary uses of crowdsourcing in planning processes.

Determining whether a particular project, business model, or constituent engagement plan should be called crowdsourcing is not always straightforward. At a minimum, we would expect that examples of crowdsourcing would include:

1. A Diverse Crowd. An effort to cultivate a diverse, heterogeneous crowd composed of experts and nonexperts.
2. A Well-defined "Call" or Problem. The crowd needs to be provided with a clear task and with some notion of the desired product.
3. Ideation. The crowd must submit innovations or ideas so that other crowd members may see them.
4. Internet. The process should utilize an easily accessible and broadly understood Internet platform.
5. Solution Selection. The crowd knows from the outset how "winning" solutions will be selected, either by those that issued the problem in the first place or through a process involving the crowd itself, like voting. (Howe 2006; Brabham 2009)

Using these criteria, we eliminated thirteen cases. Some cases simply leveraged the Internet to reach a broad audience, similar to use of social media or to an Internet-based survey instrument. These cases include: Iceland allowing feedback on its new constitution via Facebook and Twitter; Change By Us requesting suggestions for city improvements but without a solution selection process; CarrotMob leveraging the wallets of the crowd, aptly named crowdfunding; MIT's Place Pulse which attempts to understand "place" by asking the crowd a series of questions about pictures from a list of different cities (among other types of questions); and Oregon Metro's Opt In panel, a mechanism for cost-effective survey research.

In addition, we looked at two cases, Mechanical Turk and FoldIt, which use human attributes for intuition and synthesis not easily reduced to an algorithm, and a problem

requiring a large number of tries or repetitions. These are examples of cost-effective outsourcing, where the fundamental contribution from crowd members is repetition within narrowly prescribed bounds. For example, FoldIt ''gamers'' were recently acknowledged for solving the structure of an AIDS-related enzyme after scientists' ''failure of a wide range of attempts to solve the crystal structure of M-PMV retroviral protease by molecular replacement'' allowing for ''new insights for the design of antiretroviral drugs'' (Khatib et al. 2011).

Several cases utilize people as ''sensors'' in the urban environment: the Huffington Post enables bloggers to report on news; and SeeClickFix provides an online tool to report problems traditionally reported by telephone or inspection. These cases are less about open innovation, the crowd, and the procedural components of ideation and solution selection, and more about gathering information to be used by existing city systems and/or community processes.

Perhaps, the most famous example of crowdsourcing is the online T-shirt company, Threadless. First, the company puts out a call for T-shirt designs (occasionally, these calls have a required theme or design element), the crowd creates T-shirt designs and posts them on the Threadless community website, and the crowd then votes on which T-shirt Threadless should print and sell on the Threadless online store. Crowd designers that have T-shirt designs selected by the crowd receive store credit from the company.

A monetary reward enables the competition holder to increase the size of the participant pool in an effort to ensure large crowd size and crowd diversity. These cases are comprised of companies crowdsourcing the production of a service or development of a product to sell and include: Threadless; InnoCentive posts open innovation science and engineering-based challenges and rewards the winning entry; Victors & Spoils posts advertising-based problems and pays crowd participants for ideas and voting; and Nokia IdeasProject posts design challenges based on the Nokia mobile ecosystem needs and rewards the winning idea.

Even within this group, the type of reward subdivides this group into those that reward only the winning idea (e.g., Threadless, InnoCentive, IdeasProject) and those that pay for submitting ideas, more akin to work (e.g., Victors & Spoils). The US Federal government uses InnoCentive as a platform for several of its technology and science-based problems. For example, the US Air Force is rewarding $20,000 to the winning solution for recovering and reusing contaminated fuel (InnoCentive.com 2012).

Not all competitions provide a monetary reward, particularly those seeking feedback from a user community. In these cases, the crowd is mostly composed of existing customers. This group includes: Napkin Labs, which provides a social media and crowdsourcing platform for firms to gather insight from customers; and Dell IdeaStorm, Dell's own platform for crowdsourcing product designs and changes. In both of these cases, and differing from the crowdsourcing competitions that provide rewards, the purpose is often incremental improvement to an existing product elicited from current customers rather than using the crowd to create a new product to sell. Thus, the reward comes from both shaping a new product that crowd members may purchase in the future, and from gaining status among the user ''community.''

A second group of crowdsourcing competitions lacking direct monetary rewards have a more intrinsic reward: Neighborland collects neighborhood ideas from New Orleans, Louisiana, and uses its network to fund and pursue the top ideas; the newly formed Whitehouse Office of Urban Affairs used crowdsourcing to determine its main priorities; MindMixer has offered up sponsored awards, but intentionally positions its technology within the content of community discussions and the context of the specific community using it; and OpenIDEO uses its platform to tackle humanitarian issues from sponsors in an innovative, multi-step, crowdsourced process. In these cases, the reward comes from making a contribution to the community, to the world, or to an issue or need framed by shared ideology. As with previous examples, the value of contributing to the future for the community needs to be intrinsic, valued, and known in advance.

The OpenIDEO, MindMixer, and Neighborland crowdsourcing models not only adhere to the key crowdsourcing criteria of crowd ideation and solution selection, but unlike any of the other examples of crowdsourcing, or other cases we observed, use a suite of methods to encourage engagement. MindMixer and Neighborland combine existing offline processes with online tools to enhance engagement strategies, while OpenIDEO uses an online-only, multistep process.

OpenIDEO's online-only process poses a potential for disconnect between participants, place, and problem. In framing the question posed to the crowd (The Challenge), the OpenIDEO platform breaks down the question into three distinct phases, using each phase as a building block to answer the larger, more complex question. The first phase, ''Inspiration,'' uses crowdsourcing to enable the crowd to educate itself on the larger question, both informing and inspiring. Submissions are voted on through an applauding process, which elevates the highest voted submissions to the user in the next phase. The second phase, ''Concepting,'' acts as a collection point for any and all solutions to the larger problem, building off the ''Inspiration'' submissions. Submitted concepts are both broad and specific, and are again subject to voting through the applauding process.

Using the crowd voting results, OpenIDEO works with the Challenge sponsor to narrow the list of concepts to twenty. In the third phase, ''Evaluation,'' the crowd submits ideas as comments to refine and expand the twenty winning concepts. Each comment is also subject to the applauding process, encouraging the concept author to acknowledge and incorporate comments that receive frequent crowd approval. Collaboration from the crowd is encouraged, allowing for parts of eliminated concepts to be incorporated into the twenty winning concepts from the second stage, both expanding and building on these concepts.

At the end of this stage, the community votes on the refined concepts, and OpenIDEO again works with the Challenge sponsor to select a final list of winning concepts that the sponsor implements. These three phases broadly comprise OpenIDEO's novel problem-solving platform, which repeats the crowdsourcing process in each phase, and iterates, in a systematic manner, toward finding specific solutions to complex questions.

The OpenIDEO case stresses the need for both careful question framing and understanding crowd participation. OpenIDEO representatives believe that using open-ended and positive questions as the main Challenge, or problem statement, enables finding the most effective solutions (Jablow 2012). Challenges generally take the form of a question framed as, "How might we ____" (OpenIDEO 2012). This broad and open-ended initial Challenge serves as a uniting problem framework for each of the specific question, and related tasks, posed in the three phases. The entire process enables the crowd to create solutions in each phase, consequently making incremental progress toward creating a comprehensive solution to the overall problem statement extended in the Challenge.

While MindMixer is not specifically a crowdsourcing platform, it incorporates crowd engagement models featured in other feedback mechanisms like simple yes/no polling, complex surveys, and curated commenting. In this sense, it resembles a novel survey tool specifically designed for municipalities. MindMixer representatives, however, work with municipal representatives to determine which issues are most appropriate to be on a municipality's MindMixer site and which of MindMixer's tools best serve the goals for participation and engagement.

MindMixer uses a model involving "technology, content, and context" where citizen engagement is the goal through the platform, recordings of public hearings and links to relevant information, and contextually important issues. Observations by a MindMixer representative suggest that attendance and public meetings has increased after municipalities implement MindMixer because of their knowledge through the respective MindMixer site (Snyder 2012). The stated goal is to complement existing public engagement platforms rather than supplant it with an online tool.

The City of San Francisco utilizes the MindMixer platform under the name Improve San Francisco. The site uses a single-step crowdsourcing model based on crowd voting, and, at the time of writing, a crowdsourcing competition is being held for a new design for the San Francisco Municipal Transportation Authority logo. The problem statements for crowdsourcing challenges (curated challenges) are co-crafted between MindMixer and the City, although one notable challenge asks participants to create problem statements for future challenges. To encourage participation, the City offers civic-based rewards. Consistent with MindMixer's stated goals, the site also complementing existing public engagement strategies through connections with the City's other social media and web-based sites.

Neighborland uses a crowdsourcing process similar to both OpenIDEO and MindMixer. Neighborland's formation provides its own problem statement that greets visitors to Neighborland's homepage, stating, "We love New Orleans. We want Neighborland to be a fun and effective way to make our city a better place" (Neighborland 2012). Specific questions are then rooted in this statement. The crowd submits ideas by completing a sentence in the form, "I want _____ in my neighborhood." While Neighborland's online crowdsourcing model is a single-step crowdvoting process, participants are encouraged to engage their community both online and offline to gather support for their submission before the voting period ends. Neighborland then uses its funding and network to act on the winning submissions.

Forming community is key to motivating participation for OpenIDEO, Neighborland, and MindMixer. OpenIDEO representatives believe participation is motivated, in part, by crowd participants "joining a community of diverse, optimistic people to learn, share ideas and connection." Neighborland crowd participants have the advantage of having a place-based connection and a motivation to improve it. Neighborland representatives state that their purpose is to "bring more people into the development process, help them understand it, and work with community and municipal leaders to make better places" (Parham 2012). Representatives believe that to enable this, Neigborland must make community members reflect on their place, and how they can work with their community to improve it. MindMixer reaches citizens that were not previously participating in planning processes through their three-pronged technology-content-context strategy.

Representatives from OpenIDEO, Neighborland, and MindMixer suggest that motivations for crowd participations are intrinsically connected to affecting positive change, encouraged by the thought that their contributions "may actually go out into the world and achieve social impact" (Jablow 2012; Parham 2012; Snyder 2012). To help form community and encourage participation, OpenIDEO, Victor & Spoils, Napkin Labs, and several non-crowdsourcing but online communities not reviewed here, reward participation with status badges.

Neighborland, MindMixer, and OpenIDEO provide the most insight for planners. Neither example uses monetary incentive or reward, but rely instead on the crowd's motivation to improve a place or process. All three are examples of crowdsourcing and utilize questions or problems of a type encountered by planners and addressed by planning processes. OpenIDEO utilize iterative phased processes that promote online interaction, deliberation, and action. Neighborland and MindMixer incorporate online users into the existing planning processes through simple feedback and crowdsourcing tools that promote interaction, deliberation, and action both online and offline.

These cases and the way in which the term "crowdsourcing" is being used signal several things for planners interested in applying the principles of open innovation and

crowdsourcing to public planning processes. As is demonstrated by the wide range of Internet-mediated engagement mechanisms, crowdsourcing is being applied in a wide range of ways. Though there is a lot of emerging experience with ''citizen-as-sensor'' and survey research techniques, there are relatively few examples where actual planning problems are being crowdsourced.

This could be for several reasons: It could be early, too early in the application of open innovation techniques to planning to reasonably expect to find much; plans are socially constructed and are political statements, requiring, ultimately, a great deal of face-to-face interaction rather than anonymous Internet-based activity; decision makers want to know who their stakeholders are, and crowdsourcing does not necessarily lend itself to making that known; finding the good ideas either depends on a carefully framed question or the action of a ''benevolent despot,'' both of which are regarded with suspicion by politically active groups; planners may not actually articulate the questions they are trying to solve in terms or to a degree needed for successful crowdsourcing; and finally, crowdsourcing may or may not address and satisfy the major purposes for citizen participation that planners must serve.

This is not to say that crowdsourcing is not potentially useful in a public planning context, but that it must be complemented by other techniques and may simply be limited to a narrow band of specific applications. That is, once a planning problem is articulated and plan goals identified, then crowdsourcing could usefully be employed to identify options for meeting those goals. Framed another way, if good practice for crowdsourcing includes a well-defined problem, this would, superficially at least, seem to be in conflict with the notion that it is identifying problems, visions, goals, and objectives is exactly what participation in planning is intended to accomplish. However, crowdsourcing may be very useful for some participation purposes in planning at such time as the basic terms for the planning have been identified through other participatory steps. Echoing the literature, crowdsourcing and other emerging Internet-based techniques are best regarded as complements to rather than replacements for more traditional citizen involvement activities.

Though crowdsourcing may therefore have a limited or targeted application in public planning processes, it is instructive that people will participate in crowdsourcing if they view their contributions as being important to communities that they are a part of. Crowdsourcing, as with any citizen involvement activity, can be both successful and compelling for a large group if it taps into the place-based concerns and loyalties held by participants, and if participation is viewed as a means for both making a difference and gaining respect among peers.

In crowdsourcing, as in communities generally, the tone is set by the way in which the activity is regarded by those ultimately called on to make decisions. Whether it is crowdsourcing, surveying, or any other variant identified in the case studies presented here, participation will occur if there is widespread acknowledgement of the fact that participation matters to things that the crowd cares about.

Conclusion

The purposes associated with citizen participation and acted on by planners are very similar in nature to those outlined in the open innovation literature and emerging in and with the crowdsourcing literature. The correspondence between the language, processes, and intent in these realms is uncanny. Consequently, planners might be able to advance their practice by paying close attention to the ways in which other fields are seeking ''public'' involvement, and by paying close attention to the ways in which the tools for open innovation and product development are distinct from those needed for and employed in public planning. Though this review has not investigated all of the literature on innovation, the material presented here regarding open innovation and its application to understanding and acting on goals for citizen participation suggest innovation as an interesting metaphor for planning generally, and could be a fruitful area for future research.

Any kind of engagement requires time and resources. Seeking citizen involvement via the web or through crowdsourcing does not necessarily decrease the workload. In fact, in all likelihood, it will increase the workload, and agencies need to be prepared to strategically engage and manage new flows of information and ideas coming from citizens. In the crowdsourcing literature, Howe (2009) and others report on ''Sturgeon's Law,'' really a comment on the quality of participation and of the contributions made by individuals in response to the crowdsourced challenge. As one anonymous reviewer pointed out, we rarely talk about the products of participation in the same way. However, this, too, might be an interesting and necessary realm for new research, namely the degree to which planners are prepared to assess the quality of participation and products coming from it. Or, framed in a way analogous to Sturgeon's Law, what do participants really contribute? How do we assess the quality of those contributions, and when, if ever, do we determine whether they are sufficient? Should we?

From the citizen's point of view, time is also a critical resource. For citizens, participation is a leisure-time activity. Time put toward participation is not time spent with family, on hobbies, or simply hanging out. One of the intriguing aspects of crowdsourcing via electronic devices is the suggestion that online participation can boost participation overall (Mandarano et al. 2010; Snyder 2012). Citizenship has a lot of competitors. The degree to which crowdsourcing is a portal to broader participation and the introduction of practices of citizenship to new audiences is an important area for future research and practice.

Crowdsourcing and tapping the wisdom of the crowd are important concepts for planners as they design participation processes, particularly as more of those processes include

Internet-based components. Planners need to expand and refine what is known about creating and nurturing a diverse (though not necessarily representative) crowd, overcoming the digital divide, and motivating ongoing and thoughtful participation. Additionally, an area ripe for further research is the contrast between the nature of engagement among community members occurring via traditional participation techniques and the evolving notion of engagement in the online world. What are the implications for planning when your ''neighbor'' has more in common with a Facebook ''friend'' than with someone actually living next door?

There is and will remain, we suspect, an ongoing tension between expertise and experience, on one hand, and a desire to, in Brabham's (2010) words, ''aggregate rather than average'' solutions to planning problems. What planners do in the course of the planning process will need as much elaboration and transparency as our description of what the public will do, or what elected officials will do. This will force planners to clarify what it is that they bring to the table, and how it will be utilized in the process. Explaining who does what, when, and why, takes on new meaning and importance in the context of the conscious embrace of the principles of open innovation in planning. As Alexander (2009) suggested, answering the question of ''what the planning is for'' becomes the basis for determining the value of the planning, a step that may take on greater significance in the digital age.

There may also be tension between, on one hand, the fundamental nature of open innovation, which operates without respect to geography and within which tacit knowledge is found to be a detriment to motivating broad participation (Zheng et al. 2011), and on the other, the jurisdictional interests of planners and planning agencies. Simply put, jurisdiction potentially intervenes in both the construction of the crowd and the motivation for members of the crowd to participate in ways that contravene basic principles associated with eliciting the wisdom of the crowd through crowdsourcing alone. When specific geography is associated with agency or with the establishment of legitimacy for the products of planning, crowdsourcing may have less to do with problem solving and more with presenting an alternative mechanism for conducting survey research. More work needs to be done to better understand how place and territory intersect crowdsourcing and the emergence of associated online communities.

As has been the case for some time, useful citizen involvement will be the result of a multiplicity of techniques and opportunities in a planning process, not a single form or moment in time. We work with diverse publics. It should be no surprise that planners will need to do that in diverse ways. Still, the need for deliberation, for democratic decision making, and for expanding civic capacity and social capital must remain as key goals. Citizen involvement is not about enabling us all to have less to do with each other, but to enable us all to arrive at better decisions together, with better prospects for contributing to just and livable communities. Crowdsourcing does not make this process of planning and decision making less messy, but it might open up new avenues to making it more inclusive and wiser in the end.

Crowdsourcing is an emerging technique outside of its application by firms in product development cycles. There is a lot of exciting work taking place, and lots of areas for additional research and activity. Simply the rapidly advancing practice of utilizing urban information flows to inform both decision makers and citizens represents an explosion of new work and opportunity. The roles that citizens can and do play as ''sensors'' in the urban environment carry with them both promising and unsettling visions. There are great opportunities for research and practice in these fields in the future and that future is only beginning to unfold in the literature and in practice.

Appendix

Crowdsourcing Cases Reviewed.

Case	Remuneration	Crowdsourcing	Diverse Crowd	Well-defined Call	Ideation	Internet	Solution Selection	Application
Dell IdeaStrom www.ideastorm.com		X	X	X	X	X	X	Business
Threadless www.threadless.com	X	X	X	X	X	X	X	Business
Victors & Spoils www.victorsandspoils.com	X	X	X	X	X	X	X	Business
MindMixer www.mindmixer.com	Optional	X	X	X	X	X	X	City Planning & Participation
OpenIDEO www.openideo.com		X	X	X	X	X	X	Crowdsourced Problem Solving
Napkin Labs www.napkinlabs.com		X	X	X	X	X	X	Business
Whitehouse Office of Urban Affairs obamaurbanpolicy.obamacto.org		X	X	X	X	X	X	Federal Policy
Neighborland neighborland.com		X	X	X	X	X	X	Neighborhood Organizing
InnoCentive innocentive.com	X	X	X	X	X	X	X	Business
Nokia IdeasProject ideasproject.com	X	X	X	X	X	X	X	Online Brainstorming
Metro Opt-In oregonmetro.gov/optin			X			X		Survey
ChangeByUs - NYC nyc.changeby.us			X	X	X	X		Civic Social Networking
Give a Minute igiveaminute.info			X	X	X	X		Civic Social Networking
OpenStreetMap openstreetmap.org			X	X		X		Wiki Map
TheCityAtlas thecityatlas.org			X			X		Event Outreach
What's Next California nextca.org			X	X	X	X		State Policy
Iceland's Constitution government.is/constitution			X	X		X		Federal Policy
FoldIt fold.it			X	X	X	X		Scientific Research
CarrotMob carrotmob.org				X		X		Eco-friendly Business
MIT Place Pulse pulse.media.mit.edu			X	X		X		Urban Research
Amazon Mechanical Turk mturk.com	X		X	X		X		Business Services
SeeClickFix seeclickfix.com			X	X		X		City Services
Crowdbrite www.crowdbrite.com			X		X	X	X	Online Collaboration
Huffington Post huffpost.com			X	X		X		News

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