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Could "urban crowdsourcing" transform how cities are made?

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Moving towards sustainable urban development requires refining our understanding and evaluation of how cities function, improving urban design and management, and supporting a collaborative construction of cities with inhabitants and other stakeholders, who should take part in a number of urban sustainability projects (active mobility, waste management, etc.).

To address these challenges and steer policies and practices towards sustainability, the "digital revolution" could be a valuable ally. Entire sectors of our societies have been transformed by the collection and use of data streams on a completely unprecedented scale. Digital tools transformed both public and private services, while providing raw material for virtual institutions, or "platforms", to develop a new "collaborative economy" in which the individual is as much a consumer (or a user) as a contributor.

In cities, digital crowdsourcing tools build on these innovations and promise to harness the "collective intelligence" of citizens to develop new solutions, thus offering an alternative to the vision of the *smart city* as one of purely technical optimization (sensors and algorithms). As citizens become contributors of data, opinions or ideas, these tools would enable their reinstatement as key stakeholders in urban development, while the data generated is used to develop solutions that more closely match actual practices and lifestyles. In France and across the world, "urban crowdsourcing" is now the subject of many experiments, led by public authorities, private actors and citizen groups.

Given the diversity of tools, this *Issue Brief* provides an insight into the concept of urban crowdsourcing and its promises to transform the city, while identifying what conditions should be met for these tools to contribute to sustainable urban development.

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KEY MESSAGES

❚ Digital urban crowdsourcing tools offer new opportunities for citizens to produce solutions for urban management, design and planning, while contributing to the invention of a new space for citizen participation, complementing its traditional forms (voting, associative commitment, face-to-face participatory schemes, etc.).

❚ To fully realize their potential and to be beneficial for the construction and ownership of a shared sustainable urban development project, these tools must be integrated into a truly collaborative strategy, involving stakeholders beyond the simple digitalization of existing practices.

❚ By supporting the mobilization of communities of concerned users, as well as citizen engagement in urban development, crowdsourcing can accompany a transformation in public action, provided it is inscribed in a strategy favouring the openness and transparency of urban data and decision-making processes.

SciencesPo

URBAN CROWDSOURCING: WHAT IS IT?

Crowdsourcing involves reaching out to a great number of contributors to produce new content, products or data. If the concept lacks a clear definition,[1] it is because it encompasses a broad variety of applications, from the outsourcing of a task to a private company (e.g. Innocentive for R&D purposes) to the collaborative production of a free-access encyclopaedia (e.g. Wikipedia).

The central element of crowdsourcing is its focus on what the "wisdom of the crowd"[2] can produce to overcome traditional production systems. Crowdsourcing leverages the expertise, diversity and ingenuity of "non-professional" contributors, the identity of which is theoretically unknown. More ambitiously, a shared process of production, correction and evaluation has the ability to produce a "collective intelligence" that could generate better solutions and ideas of greater originality.

Urban crowdsourcing is the collection of new data about the city. The concept entails that beyond traditional data producers, such as public institutions and urban operators, other actors should be involved. It opens up a new role for city dwellers, who become stakeholders through their capacity as inhabitants, as users of spaces, infrastructure and services, and as citizens.

Why is urban crowdsourcing gaining momentum?

Underlying the wide diversity of tools and actors that develop them, three intersecting trends explain the use of crowdsourcing tools to meet the challenges of the city in a context of technological and political change.

Firstly, urban crowdsourcing initiatives are part of the *"smart cities" rationale, which seeks to optimize the production and management of urban systems*. For example, the navigation app *Waze* organizes the production of data on road traffic in real time by and for a community of drivers, sometimes in partnership with cities. Groups or associations of citizens collaboratively produce alternative representations of cities and urban systems: *Open Street Map* allows citizens to create a detailed cartography of spaces based on their experiences, while the *Digital Matatus* project aims to capture data on privately-owned minibuses *(matatu)* in Nairobi (Kenya) to increase the legibility of the city's transport system.

Urban crowdsourcing is also mobilized to support *the transformation of public action*, which is increasingly subject to evaluation and must demonstrate its legitimacy and effectiveness.[3] Tools such as *DansMaRue* or *Jaidemaville* in France allow users to inform the authorities of problems in the public space, while citizen groups use other digital tools to raise new issues and influence public action (e.g. *IWheelShare* allows users to evaluate the accessibility of spaces for people with disabilities).

Finally, crowdsourcing tools can be mobilized to engage citizens, providing a way to connect with people that may have become dissatisfied with politics and to acknowledge their "ability to challenge traditional forms of expertise and to produce information themselves that is original and helpful for public action".[4] Citizens may be given or directly claim a role in decision-making processes through tools that enable the building and supporting of alternative projects, ranging from institutional platforms such as *idée.paris.fr* to citizen tools like *voxe.org*.

A variety of tools, data and actors constitute the urban crowdsourcing landscape

The urban crowdsourcing landscape consists of a wide variety of tools and a great number of experiments that are being carried out by companies, digital start-ups, but also by many public institutions at different levels of government, associations/NGOs, and citizen groups.

The tools (web platforms and mobile applications) can be used to generate data on resource consumption, network and infrastructure use, or user behaviour. They can also help to analyse user expectations and to select recommendations, ideas or projects proposed by citizens. The data can be produced by sensors in network-connected objects (such as smartphones) or from voluntary user contributions, which can range from simple actions (e.g. taking a photo or ticking a box) to a commitment to a process (e.g. creating or discussing a project with other users). *The role of contributors thus varies considerably depending on whether they are aware that they are generating data, and—if aware—on the type of contribution and degree of reflexivity required.*

Finally, data can be collected in the form of a real-time stream (e.g. passenger information) or be

1. Estellés-Arolas, E., González-Ladrón-de-Guevara, F. (2012). "Towards an integrated crowdsourcing definition", *Journal of Information Science*, 38 (2), p. 189–200.

2. Brabham, D.C. (2012). "Motivations for Participation in a Crowdsourcing Application to Improve Public Engagement in Transit Planning", *Journal of Applied Communication Research*, 40:3, p. 307-328.

3. Chevallier, J. (2013). "L'évolution des services publics 'à la Française'", *in* Nathalie Lau (dir.), *L'État de la France 2013-2014* (21ᵉ éd.), Paris : La Découverte, p. 254.

4. Blondiaux, L. (2008). *Le nouvel esprit de la démocratie. Actualité de la démocratie participative*, Paris: Seuil, p.26.

aggregated to constitute a database or a visualization tool (e.g. a map). The degree of transparency and openness of the data and of the production process is highly variable, depending on the conditions of access and re-use defined by one or several stakeholders.

CROWDSOURCING AND SUSTAINABLE DEVELOPMENT

Urban crowdsourcing can help to meet the technical and societal challenges of sustainable development. New crowdsourced data may help provide a better understanding of urban infrastructure, networks and spaces, and especially their use patterns, enabling precise blueprints to be drawn up for the planning and regulation of complex urban systems that are increasingly integrated (mobility, energy, waste...).

An additional benefit of crowdsourcing is that it confers a new status onto the citizen. Indeed, the attainment of the sustainable development project requires a political agreement among stakeholders on the representation of the problem and its solutions. It also requires a type of governance that allows to realize the difficult trade-offs that are necessary to bring about change, while engaging citizens in the transformation of practices and lifestyles.[5]

By supporting transparency and information sharing, and by giving an active role to residents (data production, interaction with urban actors, collectively building solutions), crowdsourcing can create or strengthen citizen and stakeholder ownership of a project. For local authorities, what are issues to consider when using crowdsourcing to transform how cities are made?

Mobilizing "user communities" to better manage urban systems

Delegating the task of producing new data to citizens may seem attractive to local governments and operators, if only for financial reasons.[6] This real-time, rich and standardized data can be used directly by the public or private services that manage the city. Here, the user's role is only one of data collection (conscious or not): he or she serves as a "sensor" of the city's state and use. But how can citizens be engaged to participate in this data collection and become, as users, stakeholders in the management of spaces and services?

Figure 1. Transforming cities through crowdsourcing From a sensor-citizen to the joint construction of an urban project
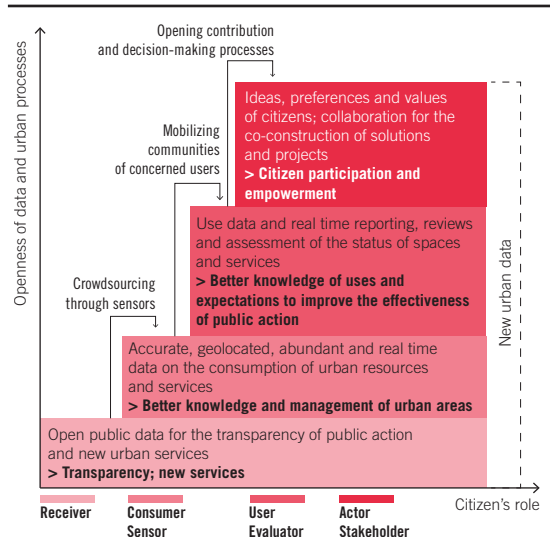
The introduction of digital tools rests on the assumption that participation should be simplified by providing tools that are straightforward, can be used rapidly, anywhere and anytime, and do not require a specific expertise to be used. Moreover, by focusing on everyday problems and neighbourhood issues (equipment mapping, usage data, status reports), these tools activate the citizens' commitment to their community. Finally, by linking the contribution activity to public institutions, these tools give their contributors the satisfaction of knowing that they can have an impact on institutional action, even at a small scale. However, it should be noted that these incentives do not cover all the potential motivations for civic engagement,[7] and there remains a question on the need to reward contributors in some way.

Nevertheless, these tools could have a decisive impact in offering "user communities" a new channel to contribute and express their interest and vision regarding certain aspects of city management (e.g. the accessibility of spaces or the cycling infrastructure). In a targeted way, and over a given period of time, these tools could enable those interested to position themselves as points of contact for public action.

For example, a waste management campaign could mobilize citizens for a month to produce

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5. Saujot, M. (2015). "La transition énergétique au défi des usages et de la participation : l'expérience des écoquartiers", IDDRI *Working Papers* n°10/2015.

6. Renault, S., Boutigny, E. (2014). "Crowdsourcing citoyen: définition et enjeux pour les villes", *Politiques et Management public*, 31/2, p. 215-237.

7. For an analysis of motivations and barriers to participation, see Mazeaud, A., Talpin, J. (2010). "Participer pour quoi faire ? Esquisse d'une sociologie de l'engagement dans les budgets participatifs", *Sociologie* 2010/3 (Vol.1), p.357-374.

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data and useful opinions and to discuss new solutions, while increasing the awareness of environmental issues among those who are not already engaged.

Beyond data exchange, a new social contract at local level?

However, the use of these tools confines the citizen to the role of a "use expert",[8] which leaves open the question of their potential to enhance citizen participation in urban governance. In fact, crowdsourcing fits into the "civic tech" movement, which uses digital technologies to strengthen the civic participation of citizens and support their empowerment,[9] i.e. their power to act individually and collectively.

Digital tools, however, run the risk of leading to the over-representation of certain neighbourhoods or populations in the virtual public space. If we intend to make these tools truly representative, to give a voice to those populations excluded from traditional forms of democracy and existing participatory mechanisms (e.g. community councils), then an ambitious investment is necessary in both education to digital technologies and in user support, to ensure that all will have access to these tools and the ability to use them.[10]

We should also be wary of the impression of neutrality that such technology might convey. Indeed, the choices made in a tool's design reflect the objectives assigned to it (data to be collected, role of the contributor, results to be obtained) and will direct the vision and experience of the contributor.[11] The format of the contribution (active or passive, individual or collective) and its objects (neighbourhood issues or vision of the city on a larger scale) will determine the participatory nature of the tool. While simple and standardized contributions facilitate data processing, they may be less able to reflect the complexity of reality, and may restrict the role of the citizen. Building capacity among citizens requires instead to provide opportunities for learning, contextualization and reflexivity through the tool. Focusing on a collective action approach and the building of a community would also allow going beyond the fragmented collection of data from a number of individual users.

Ultimately, these tools have the potential to increase the legibility of the city, its components and the way it functions, while clarifying the roles and responsibilities of different actors.[12] Transparent and open tools can facilitate the pooling of expertise, ideas and experiences in a collective intelligence rationale, to co-produce innovative solutions. By allowing the visualization and contextualization of complex information produced by a variety of actors (including citizens), they can reduce information asymmetry. However, the contribution of these tools to a genuinely shared construction of the city will depend on their actual impact on decision-making processes.

Beyond open data and e-administration, the digitization of relationships between citizens and local governments seems inevitable. We must avoid a purely technical approach, and should instead mobilize digital technology as a tool to place the citizen at the core of the sustainable cities project. Crowdsourcing offers the chance to better understand and co-produce the city, allowing a form of citizen commitment that is complementary to the more traditional forms of participation (voting, face-to-face participatory mechanisms, associations).

Cities must enhance the links between their digital, citizen participation and sustainable development policies and strategies, through a cross-cutting approach to the sustainable city. Beyond crowdsourcing, the challenge is to consider the city as the common good of its inhabitants. Transparency and the opening of data therefore seem essential: crowdsourcing tools, as well as their outcomes, would benefit from being organized as "commons", according to the models that the digital revolution has brought forward.[13] ■

8. On this question, see in particular Nez, H. (2013). "Savoir d'usage", *in* Casillo, I. *et al.* (dir.), *Dictionnaire critique et interdisciplinaire de la participation*, Paris, GIS Démocratie et Participation. http://www.dicopart.fr/fr/dico/savoir-dusage.

9. Offenhuber, D. (2016). "Civic technologies – Tools or therapy?", *Medium*, 21 January 2016.

10. See the analysis of the FING, Décider ensemble, and Démocratie ouverte on open data : *"Rôles et impacts de l'Open Data dans les processus de concertation. Trois scénarios prospectifs"*, October 2012.

11. Badouard, R. (2014). "La mise en technologie des projets politiques. Une approche «orientée design» de la participation en ligne", *Participations* 2014/1 (N°8), p. 31-54.

12. Offenhuber, D. (2014). "Infrastructure legibility – a comparative analysis of open311-based citizen feedback systems", *Cambridge Journal of Regions, Economy and Society*.

13. Conseil national du numérique (2015). *Ambition Numérique. Pour une politique française et européenne de la transition numérique*, Chapter "Bien commun et numérique", p.276, June 2015.