

CONFERENCE PAPER

NZAAR-UDCP-17-17 UDCP 2017

Digital Technologies for Inclusive Urban Planning

Stéphanie Hasler*

CEAT, EPFL (École polytechnique fédérale de Lausanne), Switzerland

* Correspondence: stephanie.hasler@epfl.ch

PUBLISHED IN

The Third NZAAR International Event Series on Natural and Built Environment, Cities, Sustainability and Advanced Engineering
International Conference on Urban Design and Cities Planning (UDCP 2017)

Pages	45–48 of the volume
Held	15 July 2017, GTower Hotel, Kuala Lumpur, Malaysia
ISSN	2463-5979 (online) 2463-5960 (print)
Publisher	New Zealand Academy of Applied Research Ltd, Auckland

ABSTRACT

Rapid urbanization, climate change, resource depletion, the wish for a more sustainable development and the widespread use of the Internet and mobile phones all represent a great challenge for urban planning. While the smart city model is seen as a means to cope with these challenges, it is often reduced to an amalgam of technologies. Citizens are usually left outside the planning process, although they produce a massive amount of data related to how they live and use the city. Applying the smart city model demonstrates that digital technologies deeply change urban management systems. These technologies also create an opportunity to reshape the planning process by generating new forms of interaction between urban planners and city dwellers, which become useful tools for sustainable and responsive planning. This research explores how these new tools can be harnessed to enhance citizen involvement in the planning process.

Keywords: Digital Participation; Urban Data; Responsive City; Smart City; Sustainability

HOW TO CITE

Stéphanie Hasler (2017). Digital Technologies for Inclusive Urban Planning. In *The Third NZAAR International Event Series on Natural and Built Environment, Cities, Sustainability and Advanced Engineering*. Kuala Lumpur, Malaysia, 15 July 2017 (pp. 45–48). Auckland: New Zealand Academy of Applied Research. ISSN 2463-5979 (online), 2463-5960 (print).

DIGITAL TECHNOLOGIES FOR INCLUSIVE URBAN PLANNING

Stéphanie Hasler*

CEAT, EFPL

[*stephanie.hasler@epfl.ch](mailto:stephanie.hasler@epfl.ch)

www.nzaar.com

Abstract

Rapid urbanization, climate change, resource depletion, the wish for a more sustainable development and the widespread use of the Internet and mobile phones all represent a great challenge for urban planning. While the smart city model is seen as a means to cope with these challenges, it is often reduced to an amalgam of technologies. Citizens are usually left outside the planning process, although they produce a massive amount of data related to how they live and use the city. Applying the smart city model demonstrates that digital technologies deeply change urban management systems. These technologies also create an opportunity to reshape the planning process by generating new forms of interaction between urban planners and city dwellers, which become useful tools for sustainable and responsive planning. This research explores how these new tools can be harnessed to enhance citizen involvement in the planning process.

Keywords: Digital Participation, Urban Data, Responsive City, Smart City, Sustainability

1. Introduction

Providing shelter to more than half of the world population, cities are the place in which to act for a more sustainable future. The smart city vision has been presented as an answer to the sustainable city challenge for two decades [1]. But smart cities focus mainly on optimizing urban systems management, such as traffic control [2–5]. In smart cities, the role of citizens, even if deemed as important, is often not clearly defined and remains peripheral [3,4,6–9]. While technological innovations have improved city dwellers' everyday life by helping them make better informed decisions, the data thus produced are hardly ever taken into account by urban planners. Yet planning for citizens, based on their behavior and their way of living is a key to a more sustainable development of cities [2,10].

The main objective of this research is to analyze how digital technology can help overcome these shortcomings by improving urban planning process, using data pertaining to inhabitants' needs and practices. More precisely, the aim of this study is to show that digital tools can open a way for more inclusive and data-driven

planning through data exchange and production.

2. Literature Review

The smart city concept has no clear definition, but the one constant feature is the massive use of information and communication technology to create a more livable, efficient and sustainable city [1,11,12]. However, researchers have criticized this vision of the smart city and pointed out the importance to shift focus from technology to people [3–5,9,13].

In contrast, participatory urbanism is not new and extensive literature already exists on this subject [14]. With the widespread use of smartphones, internet and social media, everyone can easily express their opinion. Thus, participatory planning has become even more relevant as these wide-read sentiments cannot be ignored. Indeed, digital technologies are seen as a solution to cope with the shortcomings of participatory planning processes. Many studies have started to focus on the opportunities of ICT-based participation [15–22]. They all agree on the fact that digital technologies display great potential for positive implication in participatory planning. Citizens' role is

changing, as the latter gradually transform from information receivers to data producers. Yet how citizens and urban planners are to produce and use data remains to be defined.

3. Research Methods

This research seeks to identify how to harness digital participatory processes to generate and exchange data for future planning. To this end, the method applied consists in identifying examples of digital participation projects which have been carried out around the world. Each case has been analyzed based on the type of data generated, data sources, the type of interaction, the project's implementation, as well as data use and outcomes. Documentation on these platforms and apps was collected through Google requests, web portals such as Planetizen and Engaging Cities, literature review and the app or web platform itself.

4. Analysis & Results

The collected data were classified depending on the mode (active or passive [see 10]) and the type (information, consultation, contribution and collaboration [inspired by 23]) of involvement of the participant. These data were then summarized in a table to allow comparison. The analysis focuses on two aspects regarding data, namely its production and utilization.

Digital participatory platforms and apps “amplify” data production possibilities. This concept is borrowed from E. Einstein in her work about printing [24] and has been taken up by D. Boullier [25] to explain how digitalization expands a process or a phenomenon. These projects allowed more people to participate and produce input, and diversified data type and format. On the other hand, they also increased in complexity with the diversity of the contributions. This poses the question of which information should be taken into account and what is the most relevant data.

As there is generally no room for debate, it is difficult to prioritize inputs. Voting or feedback systems can emphasize most accepted or controversial issues. Research shows that data produced through these types of practices are seldom representative, as participants generally remain anonymous.

This study also pointed out that the use and outcomes of data issued from digital participation practices are often unclear. In many cases, it wasn't possible to identify how the produced data were employed in the urban planning process. Nevertheless, in some instances, it was used as a base for on-site participatory meetings and discussions. Possible reasons to explain this absence of connection to the actual planning include: a lack of competences and resources to process, analyze and use the data; a failure of the implemented strategies to meet the needs of experts and / or that of citizens; insufficient flexibility of the planning policies and processes.

5. Discussion & Conclusion

Based on the number of projects, there is no doubt that digital planning holds great promise in data collection. But the limitations underlined in this research demand to rethink the entire planning system from communication and information exchange between stakeholders, to urban planners' own competences. Digital planning requires different tools and knowledge to be implemented efficiently and deliver the expected result. To this end, the role of the urban planner should be redefined, from expert taking top-down decisions to facilitator achieving the synthesis between bits of relevant input. Furthermore, citizens, as local experts, should be considered as sources of relevant data. City dwellers are also data consumers in a planning process as they need to be informed about what happens. In that sense, urban planners become data producers as well. Information

should flow back and forth to achieve the goal of creating a sustainable city.

New issues emerge from the data produced and collected through digital participation interfaces. It is important, however, to know which information is needed and how it shall be analyzed and used before collecting it in order for it to be fruitful.

This research was able to determine some of the limitations that prevent the smart city model to move towards a more data-driven and inclusive planning and hence responsive city, as well as identify some levers for change.

6. References

- [1] Albino, V., Berardi, U., and Dangelico, R.M. (2015) Smart Cities: Definitions, Dimensions, Performance, and Initiatives. *Journal of Urban Technology*. 22 (1), 1–19.
- [2] Batty, M. (2013) Big data, smart cities and city planning. *Dialogues in Human Geography*. 3 (3), 274–279.
- [3] Picon, A. (2015) Smart cities: a spatialised intelligence. Wiley, Chichester West Sussex.
- [4] Nam, T. and Pardo, T.A. (2011) Smart City As Urban Innovation: Focusing on Management, Policy, and Context. in: Proceedings of the 5th International Conference on Theory and Practice of Electronic Governance, ACM, New York, USApp. 185–194.
- [5] Townsend, A.M. (2013) Smart cities: big data, civic hackers, and the quest for a new utopia. WWNorton, New York.
- [6] Batty, M., Axhausen, K.W., Giannotti, F., Pozdnoukhov, A., Bazzani, A., Wachowicz, M., et al. (2012) Smart cities of the future. *The European Physical Journal Special Topics*. 214 (1), 481–518.
- [7] Kitchin, R. (2013) The real-time city? Big data and smart urbanism. *GeoJournal*. 79 (1), 1–14.
- [8] Vanolo, A. (2014) Smartmentality: The Smart City as Disciplinary Strategy. *Urban Studies*. 51 (5), 883–898.
- [9] Zubizarreta, I., Seravalli, A., and Arrizabalaga, S. (2016) Smart city concept: What it is and what it should be. *Journal of Urban Planning and Development*. 142 (1),.
- [10] Thakuriah, P.V., Tilahun, N., and Zellner, M. (2015) Big Data and Urban Informatics: Innovations and Challenges to Urban Planning and Knowledge Discovery. in: Proc. NSF Workshop on Big Data and Urban Informatics, pp. 4–32.
- [11] Dameri, R.P. and Rosenthal-Sabroux, C., Eds. (2014) Smart city. Springer, New York.
- [12] Neirotti, P., De Marco, A., Cagliano, A.C., Mangano, G., and Scorrano, F. (2014) Current trends in Smart City initiatives: Some stylised facts. *Cities*. 38 25–36.
- [13] Lombardi, P. and Vanolo, A. (2015) Smart City as a Mobile Technology: Critical Perspectives on Urban Development Policies. in: M.P. Rodríguez-Bolívar (Ed.), Transforming City Governments for Successful Smart Cities, Springer International Publishing, pp. 147–161.
- [14] Seltzer, E. and Mahmoudi, D. (2012) Citizen Participation, Open Innovation, and Crowdsourcing: Challenges and Opportunities for Planning. *Journal of Planning Literature*. 1–16.
- [15] Ertiö, T.-P. (2015) Participatory Apps for Urban Planning—Space for Improvement. *Planning Practice & Research*. 30 (3), 303–321.

- [16] Evans-Cowley, J. and Hollander, J. (2010) The New Generation of Public Participation: Internet-based Participation Tools. *Planning Practice & Research*. 25 (3), 397–408.
- [17] Hanzl, M. (2007) Information technology as a tool for public participation in urban planning: a review of experiments and potentials. *Design Studies*. 28 (3), 289–307.
- [18] Levy, S., Martens, K., and van der Heijden, R. (2015) The Everyone City: How ICT-Based Participation Shapes Urban Form. in: *Planning Support Systems and Smart Cities*, Springer, pp. 313–336.
- [19] Khan, Z., Ludlow, D., Loibl, W., and Soomro, K. (2014) ICT enabled participatory urban planning and policy development: The UrbanAPI project. *Transforming Government: People, Process and Policy*. 8 (2), 205–229.
- [20] Kahila-Tani, M., Broberg, A., Kytä, M., and Tyger, T. (2016) Let the Citizens Map—Public Participation GIS as a Planning Support System in the Helsinki Master Plan Process. *Planning Practice & Research*. 31 (2), 195–214.
- [21] Kleinhans, R., Ham, M.V., and Evans-Cowley, J. (2015) Using Social Media and Mobile Technologies to Foster Engagement and Self-Organization in Participatory Urban Planning and Neighbourhood Governance. *Planning Practice & Research*. 30 (3), 237–247.
- [22] Foth, M., Forlano, L., Satchell, C., and Gibbs, M., Eds. (2011) From social butterfly to engaged citizen: urban informatics, social media, ubiquitous computing, and mobile technology to support citizen engagement. MIT Press, Cambridge, Mass.
- [23] Arnstein, S.R. (1969) A Ladder Of Citizen Participation. *Journal of the American Institute of Planners*. 35 (4), 216–224.
- [24] Elizabeth L. Eisenstein (1991) *La révolution de l'imprimé à l'aube de l'Europe moderne*. Editions La Découverte, Paris.
- [25] Boullier, D. (2016) *Sociologie du numérique*. Armand Colin, Paris.