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Urban Challenges in a complex World - Key factors for urban growth and decline

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Data, Technology and e-Participation: New Challenges for Urban Planning

1. Theoretical background and research questions

Over the last decade, the development of technology has completely transformed the urban living environment: video conferences and emails generated new means of working (e.g. home office), online stores saw the rise of new means of shopping, and smartphones promoted new modes of transportation (eg. Uber). Urban management has improved through massive use of technology and data to optimize flows and resources (eg. dynamic taxes, automatized traffic lights, smart waste management), and generated the smart city model. In the field of urban planning, the advent of technology has facilitated the process, by simplifying exchanges and data processing, while reducing costs and saving time. However, processes have not really evolved, even though the concept behind smart cities precisely calls for smart planning.

Technology and urban data offer great potential to transform the urban planning system and adapt it to forthcoming issues [1,2]. Similar to the radical changes that occurred with the development of printing technology, digitization creates new possibilities of information production, analysis, and exchange [3]. New planning tools and methods are needed to cope with contemporary mutations, and meet the ever-changing realities of cities. Moreover, citizens are often left outside the planning process, although they hold a central position to produce and share useful knowledge on how they live and use the city [4–7]. Indeed, the development of technology and the widespread use of the Internet and smartphones offer new means to improve exchange and support urban planning [8,9]. It represents an opportunity to generate new forms of interaction between the urban planners and the city dwellers for a more sustainable and responsive planning [10,11]. Producing a large amount of user-generated and ground sensing data, digital tools offer new perspectives for a better-informed and citizen-centric planning. However, digital tools are often experimental and rarely integrated in an actual planning process. Data produced through digital methods are seldom used to inform planning [12,13].

The complexity of the issues, the social and urban dynamics and the multiplicity of stakeholders all constitute elements that call into question the process of sharing and producing information and knowledge. It is therefore important to determine the potential role that urban data and technology can play in this context. How does technology change urban planning practices? What are the opportunities and limitations of technology to improve urban planning? And finally, how should the city of tomorrow be planned? This research firstly aims to investigate how planning processes are evolving to take advantage of data and technology. Secondly, it seeks to determine the benefits and constraints of using digital tools in urban planning system, focusing in particular on knowledge and data exchange.

2. Methodology and key findings

The research questions are answered by an in-depth analysis of planning processes encountered in two case studies: Singapore and Geneva. We examine the current state of planning and how it is evolving in recent years. Fieldwork comprises unstructured and semi-structured interviews with

experts and practitioners, on-site observations, and planning documents and tools analysis. These case studies were selected because both cities are taking steps and developing strategies towards digitalization of planning processes. In addition, both have a centralized planning system and similar processes which enables comparisons. Geneva and Singapore both seek to harness digital tools and urban data to achieve a same goal, becoming sustainable and livable cities. Despite that both case studies have different approaches to digitalization, this research was able to determine advantages and limitations of the use of digital tools for urban planning.

Digital technology can be applied in various urban planning actions. It can be used to:

- Improve interactions with professionals and owners: e.g. access to planning information, electronic planning submission.
- Improve interactions with the public: e.g. collect and share information and knowledge, public engagement, e-participation.
- Improve interactions with other agencies: e.g. share data, consultations.
- Improve internal productivity: e.g. data analysis, planning support tools, monitoring, archiving.

Digital tools facilitate data analysis and allow a better understanding of urban systems. Accessing precise data generates more accurate prediction which is essential for long term planning. Technology opens new channels of exchange with all the stakeholders, especially with the population. Citizens can contribute to urban planning in active ways through dedicated platforms or in passive way through user-generated data such as mobile phone data. This new kind of data enables urban planners to gather valuable insight on ground concerns and population's need. Yet, despite the number of existing digital platforms, public feedback is mainly collected in conventional face to face meetings and paper forms. In addition, despite their relevance and value to understand people's behavior and needs, user-generated data are seldom used to inform urban planning. This study highlighted some reasons that explain the lack of use of digital tools. Firstly, the actor who initiates the project plays an important role to test and use new methods. Secondly, planning agencies often consider data collected through digital means as not sufficiently reliable or believe that digital tools do not generate relevant results and thus ignore them. Thirdly, the risk of digital divide represents an obstacle to use digital means of exchange. Finally, there is still a lack of competence in planning agencies to collect and analyze digital data.

The main constraint of going digital is that technology is evolving at a rapid pace. Urban planners need time to learn and adapt to new tools. Developing many tools in a short time without promoting their value and without a support framework results in lack of use or even non-use of the tools. Singapore is successful in developing tools that lower the barrier of entry to urban data analysis thus increasing awareness among urban planners. Furthermore, to be profitable, digital tools have to be part of the workflow. Moreover, changing current practices requires strong political vision. Sustainable change of practices occurs when bottom-up initiatives meet top-down strategies and goals.

3. Conclusion

Technology is changing the way we live in and manage the cities on a daily basis. It is crucial to adapt planning practices to cope with these emerging challenges. Going digital not only supposes translating current practices into digital actions such as drawing plans digitally instead of manually, but calls for a change of the whole planning system as well. It is necessary to act on the production of the planning process itself, and include digital tools and data from initial stages to fully take advantage of the opportunities offered by digital means. Moreover, the role of the urban planner should be redefined from expert, top-down decision-maker to facilitator and coordinator for synthesizing pieces of relevant input. Citizens are playing a new role by producing new kind of data and being increasingly implicated in urban planning. Considered as local experts, they should be seen as relevant sources of data. Digital tools represent a new interface between inhabitants and urban planners, and therefore promote comprehensive and citizen-centric planning.

Cities can learn from each other and benefit from exchanging good practices, although it is important to adapt to local context. This study highlights how digital tools create new planning perspectives by considering urban processes based on user-generated data. Furthermore, it successfully determines some of the limitations that prevent the current planning model from moving towards a data-informed and inclusive planning. Further research is needed to identify the keys for changing current practices and to tackle the issue of data protection and privacy.

References
[1] Townsend, A.M. (2013) Smart cities: big data, civic hackers, and the quest for a new utopia. WWNorton, New York.
[2] Picon, A. (2015) Smart cities: a spatialised intelligence. Wiley, Chichester West Sussex.
[3] Boullier, D. (2016) Sociologie du numérique. Armand Colin, Paris.
[4] Vanolo, A. (2014) Smartmentality : The Smart City as Disciplinary Strategy. *Urban Studies*. 51 (5), 883–898.
[5] 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.
[6] 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.
[7] 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),.
[8] Evans-Cowley, J.S. (2010) Planning in the age of Facebook: the role of social networking in planning processes. *GeoJournal*. 75 (5), 407–420.
[9] Kunze, A., Burkhard, R., Gebhardt, S., and Tuncer, B. (2012) Visualization and Decision Support Tools in Urban Planning. in: Digital Urban Modeling and Simulation, Springer, Berlinpp. 279–298.
[10] Saujot, M. and Feraudy, T. de (2016) Urban crowdsourcing: digital technologies for sustainable cities? *Iddri Blog*.
[11] Martos, A., Pacheco-Torres, R., Ordóñez, J., and Jadraque-Gago, E. (2016) Towards successful environmental performance of sustainable cities: Intervening sectors. A review. *Renewable and Sustainable Energy Reviews*. 57 479–495.
[12] 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.
[13] Hasler, S., Chenal, J., and Soutter, M. (2017) Digital Tools as a Means to Foster Inclusive, Data-informed Urban Planning. *Civil Engineering and Architecture*. 5 (6), 230–239.