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Planners Out-of-the-Way to Be "Smart"?

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ABSTRACT

In the Canadian federal smart cities challenge, over one hundred communities across Canada are pursuing funding to become "smart". A shared consensus is that technologies are significant to achieving the goal and they must be planned for. However, most planners actually are less involved in smart city initiatives than one might think. Planners and planning divisions seem "pushed out-of-the-way" to be smart. We performed content analysis on literature and official documents, followed by in-depth interviews to assess the role of planners in smart cities. Grounded theory, a rigorous qualitative research approach, was used to develop an explanation of potential changes in planners' roles. Data derived from the literature, documents, and interviews tested the hypothesis that planners played an essential role in smart cities. We find that planners need to update and expand their skill set if they are to be included in smart city initiatives.

1. Introduction

The smart cities challenge (SCC), a pan-Canada competition open to communities of all sizes, is currently undertaking. The government received 130 eligible applications from municipalities, regional governments and Indigenous communities. The themes appeared in the SCC included economic opportunities, empowerment and inclusion, environmental quality, healthy living and recreation, mobility, as well as safety and security (Infrastructure Canada, 2018). There was no unified understanding about smart cities, but technologies were claimed to be important and frequently mentioned in applications. In academic, some researchers even see technologies as the foundations of smart cities (Harrison et al, 2010).

What not explicitly noted is that planning may be the government function mostly related to this challenge. Advocating technologies is not a new trend in the planning field. "The urge to bring scientific methods to urban planning seems to reappear every few decades" (Townsend, 2015: 203). Smart cities could represent such a reappearance. Goodspeed (2015) identifies the same underlying concept of smart cities and urban cybernetics, and he argues that smart cities are just a rebranding of early attempts. Computer-based planning like rational urban models failed in 1970s (Lee, 1973) or planning support system (PSS) has never been valuable since created in 1990s (Geertman, 2017). It remains to see how smart cities will be developed.

An interesting phenomenon is that planners and planning divisions seem out-of-the-way to be "smart". There are chief administrative office (e.g., City of Calgary) or new-established smart city office (e.g., City of Montreal) operating smart initiatives, while planners are less involved in. It is worth questioning why this phenomenon occurs and what the role of planers is in smart cities. To answer the questions, main contents of computer-based planning and smart cities as well as their interrelationships must be understood. Moreover, potential changes on planners' work in this smart city age must be elucidated through continued theory refinement. Theoretical explanation of computer-based planning and smart cities has shown promise for certain constructs,

such as PSS (Harris & Batty, 1993) and the foundations of smart cities (Harrison et al, 2010). However, a framework of planners' roles in smart cities is not currently available guiding the process of engaging planners in smart initiatives. The purpose of this study was to contribute to this process through development of a hypothesis illustrating the potential role of planners in smart cities.

2. Methods and Data

A grounded theory approach (Lewis, 2015) was selected because of the lack of knowledge regarding definition of smart cities, interrelationships between computer-based planning and smart cities. An iterative process of data collection and analysis was used to develop a theoretical explanation of potential changes on planners' roles grounded in data collected from those planning their communities in the smart city age. The grounded theory approach was applied to illustrating the essentiality of planners' work in smart cities. This study was approved by the Research Ethics Board of McGill University.

2.1 Data Collection

2.1.1 Sampling

Comprehensive review was conducted on literature about computer-based planning, mainly PSS, and smart cities. This review includes 165 relevant literature from 1970s to present. Criterion sampling method (Patton, 1990) was employed to gather information-rich smart city cases recorded in official documents. Inclusion criteria for this study were western cities with similar democratic systems as Canada's, have been urbanized, and at least related to one theme proposed in the SCC.

In-depth interviews were conducted with Canadian planners from communities that competed in the SCC. There was a Canadian institute of planning (CIP) conference held in July, 2018, gathering planners across Canada. It was an appropriate place to recruit the participants. The CIP official website provides contact information of attending planners. We first made a phone call to a potential participant during weekdays. If she/ he was willing to participate, a follow-up email would be sent with details about this research, a cover letter, and a consent form. If the first call was not answered, we attempted to send an email directly inviting participants. If still without response, we would try one last call a week later. Snowball sampling was employed for getting more responses. It is worth noting that this study is less sensitive to randomness of samples. Results can be significant as long as there are enough authentic data.

In grounded theory, theoretical saturation is the ultimate criterion determining sample size, which means data need to be collected until the theory is built saturated (Strauss & Corbin, 1998). In this study, a sample size of 20 planners was used for in-depth interviews. The final sample sizes were adjusted by theoretical saturation.

2.1.2 Literature and Official Documents

The literature on PSS and smart cities were free accessed through McGill library website. The smart cities were identified on the SCC website and the What Works Cities website. We then visited the government websites of selected cities to access official documents. Content analysis performed on literature and documents aimed to development of guiding questions for in-depth interviews. Based on the research questions, content analysis should explore constructs of PSS and smart cities and their interrelationships. The guiding questions were modified as the content analysis progressed to further refine the information and develop theoretical explanation.

2.1.3 In-depth Interviews

When content analysis was completed, we obtained the guiding questions. The purpose of in-depth interviews was answering the doubt of planners' roles in smart cities through incorporating the data into analysis for a more refined hypothesis. All interviews were recorded as voice memos with

permission of participants and transcribed verbatim. Transcripts were entered into the MAXQDA 12 program for analysis.

2.2 Data Analysis

The basic principles of grounded theory guided overall analysis (Strauss & Corbin, 1998). Content analysis was applied to literature, documents, and interview transcripts at a micro scale, where we ensured that no important ideas were overlooked. Grounded theory required the process of coding, constant comparison, and theoretical saturation (Bryman, Bell & Teevan, 2012). Coding was breaking down data into interrelated components and assigning them with codes, which was iteratively developed through constant comparison between new data and existing data within a particular category. The iteration ended until reaching theoretical saturation that meant no further gains when continuing the coding and comparison (Bryman, Bell & Teevan, 2012). With the most relevant categories being integrated, we developed a hypothesis of the role of planers in smart cities.

3. Results & Discussion

The comprehensive literature review and analysis of smart city cases provided basis for the hypothesis illustrating planners' roles in smart cities. Analyzing interview transcripts verified the preliminary results and develop the final hypothesis.

3.1 Constructs of PSS and Smart Cities

Three fundamenta of PSS were identified: an integrative system, decision supports, planning-related components. PSS is an integrative system that includes analysis models, geographic information system (GIS), visualization and communication tools, supporting planning decision-makings through a user interface and knowledge database. There were multiple ways to illustrate smart cities, but generally, they were applications of information and communication technologies (ICTs) and aspirations of improving lives of residents. The smart city takes advantage of sensors (e.g., cellphones), new data technologies (e.g., big data analytics, cloud computing), and data themselves, to improve critical infrastructures and services including urban planning, management and governance.

As aforementioned, smart cities were argued as a concept sharing a strong similarity with urban cybernetics debated in 1970s (Goodspeed, 2015). There were also beliefs that smart cities were new to the planning field. Usage of the adjective 'smart' suggested a transformation brought by new technologies to the urban context (Nam & Pardo, 2011). Compared to the 1970s, the technologies of smart cities were vast and indicated that many municipal processes could be automated. However, smart cities certainly suffered from wicked problems as urban cybernetics did. Urban complexity would thwart scientific attempts to solve planning problems that were wicked since they had no definitive description, involve value judgements and occur in unique contexts (Rittel & Webber, 1973). Most of problems, like climate change, targeted by smart city initiatives were actually as wicked as planning problems. Moreover, there were more challenges when pursuing smart city goals, such as technocracy and opacity, digital divides, and the changing role of public participation.

3.2 Why Planners Less Involved

With review of PSS and smart city constructs, we inferred that planners' limited involvement in smart cities was due to their lack of knowledge about smart cities and new technologies. Besides, since PSS had been critiqued for decades, planners knew the defects of applying scientific methods to planning problems. They were likely to show less interests in smart cities. In addition, planners could realize the challenges of implementing smart initiatives and doubt about the feasibility of this movement.

We decided guiding questions for in-depth interviews to include inquiries of

planners' background, the computer-based tools they used in work, their knowledge and experience of smart cities, and their opinions on how smart cities might impact their work. We interviewed 20 planners from 17 planning sectors across Canada. Most of them had been working in the field for over 10 years. The areas they focused vary from transportation to preservation, and from building to policy-making.

The results shown that only two planners had a role in smart initiatives. One was a lead planner for carbon-neutral buildings and the other worked on automatic transportation monitoring. Another two policy planners indirectly involved in the initiatives by reviewing the master plans. Half of planners could not think of any smart initiative happening in their cities, and over 70% of them do not involve in any smart city technologies. Planners had insufficient knowledge about smart cities, which would be the first reason for limited involvement of planners.

Surprisingly, planners were also not knowledgeable about PSS or computer-based planning in general. The computer-based tools they used including routine supports (e.g., Microsoft Office), design supports (e.g., InDesign), and GIS (e.g., ArcGIS), whereas no sophisticated decision supports like PSS. This indicated that they were unfamiliar with the history of urban cybernetics and the critique of wicked problems. Therefore, planners would not link smart cities to early attempts. The defects of scientific methods did not account for the limited involvement.

When talking about how smart cities could impact their work, planners strongly believe human-centric approaches could never be changed. They, indeed, were concerned with problems in communicating with the public (e.g., technocracy) and issues of inequality (e.g., digital divides). A few planners also mentioned the dangerous of trending neoliberal. They saw flaws in smart cities. The challenges of realizing smart initiatives could be concerns stopping them from a deep involvement.

Notably, divergence of different planning domains might be a significant factor that influence planners' involvement. The participants who had a role in smart initiatives were building and transportation planners. They were more likely to engage in engineering and technological projects. Nevertheless, policy planners may never have chance to use fancy technologies in their work. Knowledge about smart cities have never been necessary for doing their work over the past decades and even now. Therefore, involvement of planners in smart cities could largely depend on their work domains.

3.3 The Role of Planners in Smart Cities

It was not surprised that nearly all planners agreed on that planners should have an essential role in smart cities. They were very open to talk the advantages of smart city technologies to assist in public engagement. However, when it came to changes of their work, like collecting data through internet of things devices or engaging in smart city software building, planners were getting cautious and just slightly agreed on the potential changes of their work. They strongly rejected the hypothesis that the role of planners would change to that of an administrator, overseeing data-driven or crowdsourced solutions. It inferred that planners saw their current planning work so important and they might afraid of being changed by smart city technologies. Even though, most of planners still supported the idea that planning schools provided training programs to help them use smart city technologies. The contradictory enclosed in planners' responses indicated that they were trying to find a middle ground between a radical trend of smart cities and a conservative mode of urban planning.

The hypothesis of planners' roles in smart cities can be made based on the information presented above. First and foremost, planners still have unique values in terms of dealing with wicked or political problems in planning or smart cities. They will continue the work on engaging the

public, communicating with stakeholders, and synthesizing analysis results for decision-makings. However, planners will expand their skill set to embrace smart city technologies. Planners may apply the technologies, such as artificial intelligence, to automate uncreative work and high-structured tasks. After a tame regulatory mechanism constructed, planners will more focus on conforming ethical principles and managing polarizing effects of technologies appropriately.

4. Conclusion

This study investigates the reasons for limited involvement of planners in smart city initiatives and contributes to the knowledge of the potential role of planners in the age of smart city. Future studies can use the knowledge gained to further develop theories on the how smart cities interact with urban planning and impact planners' roles. The findings also inform that the historical links between planning and technologies hide important inference for studying interrelationships between urban planning and smart cities. Furthermore, the characteristics of new technologies used in smart cities should be further studied for predicting the impacts of smart cities on the planning field. It is worth noting that looking at the issues emerging with smart cities is also a significant direction to conducting further studies.

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