



## Creating smarter cities: Considerations for selecting online participatory tools



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### ABSTRACT

The abundance of online public participation tools has made it difficult for planning organizations to decide which tool will best meet their needs. Understanding the benefits or challenges of specific tools, facilitation requirements, or how individual tools may best advance the public participation aims is not always easy. This article builds on theories of planning, organizations, and information science to discuss various factors that cities and planning organizations should consider in deciding whether and how they should choose online participatory tools. While the technical capability of online technologies in facilitating participation and decision making should be examined, the capability of planning organizations and communities in adopting these technologies should be considered as well. This article argues that planning organizations should choose a participation platform based on the capacities of their organization, the characteristics of the communities that are going to use the tool, user-community norms and rules, and the tool's capabilities.

### 1. Introduction

Information and Communication Technologies (ICTs) have given rise to the ideal that cities will become increasingly smart, connected, responsive, and citizen-centric (Albino, Berardi, & Dangelico, 2015; Kitchin, 2013; Townsend, 2013). This focus on the citizen-centricity of smart cities (Albino et al., 2015; Caragliu, Del Bo, & Nijkamp, 2011; Neirotti, De Marco, Cagliano, Mangano, & Scorrano, 2014) emphasizes the potential of online participatory technologies to allow citizens to actively engage in shaping their city. Participatory technologies have been growing in popularity with an increasing number of cities and planning agencies using technology to engage the public in planning processes (Angelidou, 2014; Evans-Cowley & Manta Conroy, 2006; Schweitzer, 2014). The effectiveness of these technologies may be related to a variety of organizational and contextual factors, including organizations' capacities to use technologies (DeSanctis & Poole, 1994), citizens' interest in and attitude towards participation (Arnstein, 1969), and citizen participation mandates (Hoch, 2007a, 2007b).

Online participatory tools (OPTs) refer to two types of technologies: (1) web-based tools that are particularly designed for public engagement (e.g. MySideWalk, PlaceSpeak, CitySourced, Crowdbrite); and (2) social networking sites (e.g. Facebook, Nextdoor) that are not designed for public engagement but can be used for participatory planning.

Despite the popularity and availability of these participatory tools, planners report that they are unsure how to select an appropriate tool (Afzalan, 2015). The effectiveness of using OPTs in planning processes can be influenced by a number of factors, including citizens' technology literacy, planners' expertise, organizational resources, and the tools' capabilities.

While OPTs can strongly support and facilitate participatory planning processes (Evans-Cowley & Hollander, 2010; Jeffres, 2010; Mandarano, Meenar, & Steins, 2010), their inappropriate use can result in problems, such as instrumental use of citizens' mass participation (Brabham, 2009; Evans-Cowley & Manta Conroy, 2006; Schweitzer & Stephenson, 2016). With technological advances and the rise of wireless internet and social media, new types of planning or decision-support systems (See Batty, 1995; Danziger, 1977; Geertman & Stillwell, 2004; Klosterman, 1999) have emerged, focusing on bottom-up and citizen-facilitated approaches (Evans-Cowley & Hollander, 2010; Tayebi, 2013a). This emergence has resulted in the increasing availability of and range of choice in OPTs, supporting both online and face-to-face participation (Afzalan & Muller, 2014; Hampton & Wellman, 2003). With the abundance of OPTs, the question becomes how a planning organization should decide about using online participatory tools.

In this review article, we explore the following question: "What considerations should planning organizations take into account when

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they are selecting online participatory tools?” We build on theories from planning, organization, and information science to discuss considerations of incorporating new technologies in planning process for planning organizations. We argue that planning organizations should evaluate the circumstances in which the technologies are being used and measure the tools' technical capabilities when deciding whether and how to use OPTs. In four sections, this article discusses the need for OPTs and the organizational factors that influence their adoption; defines a framework to discuss in detail the role of each of these factors; and concludes with a discussion that emphasizes the importance of factors that shape the planning environment in the selection of OPTs.

## 2. Participatory planning and smart cities

Smart cities are variously defined. While some scholars focus on the technical capabilities of new technologies in advancing cities' efficiency, others explore the role of innovative initiatives, networks, or communities created by the technological advances (Albino et al., 2015). In this article, we argue that smart-city approaches should contribute to innovation and enhance democratic decision making (Neirotti et al., 2014) and transparency (Angelidou, 2015; Viitanen & Kingston, 2014) through public participation (Giffinger, 2007; Neirotti et al., 2014). Participatory processes play crucial roles in creating smarter cities by helping organizations respond to wicked problems (Goodspeed, 2015), democratize decision making (Angelidou, 2015; Viitanen & Kingston, 2014), learning about citizens' interests and ideas (Kitchin, 2013), or increase social capital (Lombardi, 2011).

Cities and planning organizations are increasingly using OPTs for citizen participation (Afzalan & Evans-Cowley, 2015). With the increased use of social media and new technological advancements, OPTs are emerging as new types of Planning Support Systems (PSS). While previous types of PSS have been strongly supported by the popularity of Geographic Information Systems (GIS) (Klosterman, 1997), more recent technologies are more interactive, communicative, and focused on social networking enhanced by web-based technologies (Afzalan, 2015). CommunityViz (see Bailey, Blandford, Grossardt, & Ripy, 2011; Klosterman & Pettit, 2005), UrbanSim (see Waddell, 2007), What-if (see Klosterman, 2001; Klosterman, 1999), and Envision Tomorrow (see Minner, 2015) are examples of PSS that are now becoming more participatory processes through their integration with the online environment. OPTs are diverse and have a variety of functions. For example, Crowdbrite facilitates brainstorming through combining online and face-to-face interactions; MySideWalk and PlaceSpeak provide interactive online discussion forums; CitySourced crowdsources citizens' requests; and NextDoor facilitates neighbors' social interaction. While each one of these tools has unique capabilities, they all use the Internet to facilitate collaboration or interaction.

To select the appropriate tool or method, planning organizations must start with the key elements of participatory processes. These processes focus on responding to public interest and promoting open-ended interactions to provide opportunities for participants that constantly redefine the “what” and “how” of the issues that they address (Quick & Feldman, 2011, p. 286). These processes can provide opportunities for consensus building or learning among diverse stakeholders (Goldstein & Butler, 2010), democratic decision making (Huxley & Yiftachel, 2000), mobilizing actions (Brody, 2003), engaging local knowledge (Corburn, 2005), or responding to regulations or community norms (Hoch, 2007a, 2007b).

Despite increasing emphasis over the last five decades on participatory planning and community engagement, planning organizations and local governments still face challenges in incorporating new or traditional participatory processes into their decisions and plan making. Some of these challenges include a lack of interest in participation (Fischer, 2000), decision makers' lack of trust in public participation (Kapoor, 2001), or the high cost of participatory processes caused by resource requirements (Bamberg, 2013). To address some of these

challenges and increase the potential for public engagement, planning organizations have been actively trying to use various tools, including OPTs, in the last decade. However, adopting new technologies can be difficult for planning organizations (Innes & Booher, 2010; Innes & Gruber, 2005). The organizations may not have access to skilled staff who can effectively apply the new technologies and they may have trouble ensuring that participants will accept and trust the types of technology being used.

## 3. Adoption of online participatory tools by planning organizations

In this section, we build on literature from the organizational science field, adopting structuration theory (DeSanctis & Poole, 1994) and the “phronesis” approach (Flyvbjerg, 2006) to discuss factors that can influence the adoption of new technologies by planning organizations.

Research about planning organizations is primarily tied to the discussion of power and politics in planning and explores the role of formal and informal organizations in shaping planning practice or democratizing citizens' participation and resource allocation (Forester, 1989). While planning theory has not extensively explored the adoption of new participatory technologies or methods by planners, there is a broad literature on this topic in public policy and information science (See Brudney, 1995; Cresswell & Sheikh, 2013; Godschalk, 1996). Organizational research on participatory decision-making processes is complex since organizational functions are influenced by various internal and external factors, including availability of organizational resources for adopting new technologies, communities' levels of education, and community members' skills in using online tools (Stutzman, 2005).

To organize new procedures, planning organizations may need to make political or organizational changes, adopt new frameworks, or design more flexible procedures (Kapoor, 2001). For example, they may need to work with outside organizations to more effectively use new technologies (Palfrey & Gasser, 2012). Various factors related to the context in which a planning organization may wish to use an OPT can influence adoption and usability. A relationship exists between the effectiveness of participation based on the technology chosen and the type of projects in which the technology is used or the characteristics of the project environment (Felín & Zenger, 2014; Gil-García & Pardo, 2005). The type and mission of organizations (Gillett, Lehr, & Osorio, 2004; Townsend, 2013) or their regulatory environment (Gil-García & Pardo, 2005) can also influence the effectiveness of technology integration.

Organizational adoption of new technologies is dependent on the context in which they are being used. Flyvbjerg's (2006) phronesis approach and Giddens' structuration theories inform organizational research based on contextual factors. The phronesis approach emphasizes the role of power in institutional collaboration and deliberation on values and diverse interests. Phronesis is context-dependent and focuses on values, judgments, and social orders rather than technical or scientific knowledge (Flyvbjerg, 2006, pp. 370, 372). Organizational research should focus on small but deep, detailed, and thick questions; should value power forces and imbalances; and should go beyond looking at agency structures and explore both structures and actors (Flyvbjerg, 2006, pp. 376–377). For example, while the presence of a city office of information technology may facilitate adoption of new tools by cities, how planners or community engagement specialists at the city use these tools is also important. Similar to hermeneutic approaches, structuralism has also influenced organizational research, where the role of agencies and agents is constructed through inter-related interactions (Giddens, 1984, p. 19). Taking a sociotechnical approach, DeSanctis and Poole (1994) introduced Adaptive Structuralism Theory (AST), which studies the structure that is reproduced through humans' use of technology (DeSanctis & Poole, 1994, p. 121).

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