City, Culture and Society xxx (xxxx) xxx–xxx

Contents lists available at ScienceDirect

City, Culture and Society

journal homepage: www.elsevier.com/locate/ccs

Blending pop-up urbanism and participatory technologies: Challenges and opportunities for inclusive city making

Joel Fredericks*, Luke Hespanhol, Callum Parker, Dawei Zhou, Martin Tomitsch

Design Lab, Sydney School of Architecture, Design and Planning, The University of Sydney, Australia

ARTICLE INFO

Keywords:
Community engagement
Digital placemaking
Participatory technologies
Pop-ups
Pop-up urbanism
Engagement channels
Smart cities

ABSTRACT

This article investigates the use of participatory technologies for augmenting urban governance by giving citizens and local communities a voice in the city making process. We present a series of situated and temporary pop-up interventions deployed in public spaces that demonstrate the use of participatory technologies for engaging citizens in localised conversations. Through two field studies of digitally augmented pop-up interventions we discuss the value of various digital and analogue engagement channels and their effectiveness for allowing people to submit their views on various city making initiatives. We outline our design process and discuss the impacts of using multiple engagement channels to engage with a broader cross-section of society in the city making process. The article concludes on challenges and opportunities for digital placemaking strategies, and how such strategies can contribute to wider smart city initiatives.

1. Introduction

Smart city research increasingly acknowledges bottom-up initiatives as drivers for urban innovation (Caragliu, Del Bo, & Nijkamp, 2011; Han, Hawken, & Williams, 2015). At the same time, local governments are realising the limitations of top-down technology-centric solutions and starting to look at community-driven initiatives to inform solutions that improve the liveability of cities and their citizens, rather than being driven by key performance indicators focusing on efficiency and effectiveness. This branch of smart city research aligns well with the concept of placemaking – practiced in urban planning as a way of creating a sense of 'place', which is regarded in urban design as a "human need, essential for wellbeing and feelings of safety, security and orientation, and a remedy against feelings of alienation and estrangement" (Aravot, 2002). The use of digital technologies and media for shaping urban experiences that are citizen-centric, both in their conception and implementation, is also referred to as 'digital placemaking' (Tomitsch, 2016). In the context of this article, we more specifically use the term to refer to the use of digital technologies to inform city making by engaging citizens and local communities (Fredericks, Hespanhol, & Tomitsch, 2016).

However, such citizen-centred city development poses new challenges for governments as it requires a more collaborative approach than the currently practiced community engagement process, which commonly takes a 'one size fits all' approach to city making. Currently, community engagement is undertaken by local governments as a means of 'informing' and 'involving' citizens about infrastructure developments and policy changes within the built environment. However, traditional community engagement activities, such as town hall meetings, workshops and online surveys only reach certain demographics within local communities. As a consequence of this, opinions and input from the wider community, including time poor citizens, younger demographics and culturally and linguistically diverse people are not considered during the engagement process. Researchers and commentators have consequently argued that traditional community engagement activities are top-down, outdated, non-inclusive, fragment communities and rarely achieve genuine engagement outcomes (Fredericks, Tomitsch, Hespanhol, & McArthur, 2015; Hosio, Goncalves, Kostakos, & Riekki, 2014; Innes & Booher, 2004; Schroeter, 2012).

A growing body of research has investigated the use of participatory technologies to address these shortcomings of traditional community engagement with a particular emphasis on engaging citizens in localised conversations within certain urban environments around community topics (Gianluca et al., 2013; McCarthy et al., 2009; Taylor et al., 2012). Participatory technologies have been deployed in a variety of built environment settings as a means of engaging with citizens on local issues using specific platforms, such as urban screens (Fredericks et al., 2015; Schroeter & Foth, 2009), media façades (Behrens, Valkanova, gen. Schieck, & Brumby, 2014), projections (Valkanova, Walter, Vande Moere, & Müller, 2014), interactive posters

* Corresponding author.
E-mail addresses: joel.fredericks@sydney.edu.au (J. Fredericks), Luke.hespanhol@sydney.edu.au (L. Hespanhol), callum.parker@sydney.edu.au (C. Parker), dawei.zhou@sydney.edu.au (D. Zhou), martin.tomitsch@sydney.edu.au (M. Tomitsch).

http://dx.doi.org/10.1016/j.ccs.2017.06.005
Received 24 January 2017; Received in revised form 9 June 2017; Accepted 21 June 2017

(Vlachokyriakos et al., 2014), and distributed voting systems (Hespanhol et al., 2015; Koeman, Kalnikaité, & Rogers, 2015; Steinberger, Foth, & Alt, 2014). Such an approach has the potential to augment urban governance by giving citizens an opportunity to express their opinions 'on the go' (Hespanhol et al., 2015).

Previous projects have successfully managed to attract passers-by to interact with the technology platform, however, in most cases these interventions are limited to only one form of digital input for submitting responses and one form of digital output for visualising community feedback. For example, *Vote As You Go* (Hespanhol et al., 2015) allowed people to submit a response via a kiosk-like tablet device; aggregated results were then displayed on an urban screen. Passers-by therefore need to be familiar with the technology used in the intervention in order to participate in the engagement process, and willing to do so. While these technology-enhanced approaches to community engagement and city making successfully manage to involve demographics that are usually left out in traditional engagement activities (Fredericks & Foth, 2013; Fredericks, Caldwell, & Tomitsch, 2016), they too fail to implement a truly collaborative approach.

To address this gap, our research investigates the design of two pop-up urbanism (Fredericks et al., 2015; Lydon et al., 2014) interventions that use a combination of digital and analogue media for community engagement. Specifically, we were interested in understanding how engagement channels can be created to effectively attract people and promote interaction. These media offer multiple input and/or output channels for people to engage with, e.g. by visualising an aggregated view of participant responses. The interventions presented in this article integrate this hybrid approach with the use of pop-ups as temporary deployments in public space. The situatedness of the interventions and availability of multiple walk-up-and-use engagement channels contributed towards a more collaborative and varied engagement process. We employed a middle-out design (Fredericks, Caldwell et al., 2016) approach for the development and design of our two pop-up interventions by involving top-down decision makers and bottom-up community groups. This approach integrates the needs and interests from the top with those of the everyday people from the bottom, which are met somewhere in the middle. We present two field studies, *Digitally Augmented Pop-Up* and *Pop-Spot*, in which we embedded digital and analogue media into pop-up interventions, enabling passers-by to 'have their say' on localised matters and see accumulative results in real-time.

The article contributes to smart cities research and urban innovation in three ways. First, it provides a design exploration of using analogue media in addition to digital interfaces within the context of community engagement. To that end, the paper builds on and extends previous digital placemaking (Fredericks, Hespanhol et al., 2016; Tomitsch, 2016) research that investigates the application of participatory technologies for improving existing city infrastructure. Second, we present an analysis of the interactions and interaction patterns from two field studies involving digital and analogue media as engagement channels. Third, we discuss implications from our findings for the deployment of participatory technologies in public space, which contribute towards an emerging area of smart cities research. The remainder of this article is structured as follows. First, we review related work on participatory technologies for community engagement. We subsequently outline the context of the field studies, the design process that led to the interventions and the results from their evaluation in the field. We then discuss key aspects of using digital and analogue technologies for collaborative city making initiatives and present key takeaways for embedding them into smart cities initiatives and other types of urban interventions.

2. Participatory technologies and community engagement

Technologies play a key role in the communication of information to local communities. Traditional media channels, such as television, radio and newspapers are being used by local governments and elected representatives to inform and engage with citizens (Taylor et al., 2012). In addition to this the internet and social media are also being used as a tool to facilitate a dialogue, encourage participation (Fredericks & Foth, 2013), and create a platform to deliberate over community wide issues. However, traditional media and web-based technologies are limited to the audience who use them, and can often exclude people who are time poor or do not have access to technology, therefore creating a gap between those who access information and those who do not. The integration of digital technologies has become increasingly pervasive within urban environments, as they have evolved from being used in official locations and assimilated into the fabric of daily life (Tomitsch, 2014). In particular, urban planners, architects and interaction design researchers have investigated the use of participatory technologies in the city making process, highlighting that people are 'citizens' of technologies rather than just 'users' of mobile phone devices and smart technologies (Foth, Tomitsch, Satchell, & Haeusler, 2015).

A number of approaches have emerged that investigate new opportunities for community engagement enabled through digital technologies, including digital placemaking (Fredericks, Hespanhol et al., 2016; Tomitsch, 2016), urban interaction design (Brynskov et al., 2014), urban informatics (Foth, Choi, & Satchell, 2011), and urban HCI (Fischer & Hornecker, 2012). What these approaches have in common is the application of digital technologies for connecting communities with their city. Transdisciplinary research projects, including urban planners, architects and interaction designers, have previously investigated the use of urban screens, media façades, public displays, voting technology and pop-up interventions for community engagement. Schroeter and Foth (2009) developed *Discussions in Space,* which enabled passers-by to respond to community topics displayed on an existing urban screen using SMS and Twitter. Boring et al. (2011) investigated how media façades could be used by multiple people for collaborative interactions in public spaces. Public displays have also been used to engage with people in urban spaces, including through hand gestures (Hoggenmüller & Wiethoff, 2014) and interactive touchscreens (Memarovic, Elhart, & Langheinrich, 2011). Our research is particularly interested in how access and use of technology affect the experience of everyday people in public space.

Novel and creative situated engagement approaches have also been deployed in public space with the intention of attracting the attention of passers-by. In particular, situated voting technologies have been used as a means of collecting feedback from citizens around local contexts. For example, Hespanhol et al. (2015) deployed two *Vote As You Go* input interfaces in conjunction with an urban screen in a public square. The first consisted of a survey running on a tablet mounted on a stand, with a live camera feed streamed to the urban screen. The second incorporated an interactive body movement interface, which was broadcast live to the urban screen. The input interfaces were an effective strategy for attracting the attention of passers-by and converting them into active participants, whilst at the same time presenting the accumulative results on the urban screen. Similarly, Taylor et al. (2012) deployed *Viewpoint* as a situated voting device in public spaces frequented by members of the community and ensured widespread coverage. The voting device displayed an engagement question, which a person could answer by simply pushing a button as the input channel. Participants could also scroll through the output results by using a results dial, which displayed current results and the accumulative number of votes.

Other research has investigated the active involvement of community members through the deployment of situated and temporary pop-up interventions. Fredericks et al. (2015) investigated bespoke community engagement in public spaces through a series of digital pop-up interventions. Combining digital interfaces and a physical pop-up within a public space equipped with an existing urban screen, the study aimed to engage with passers-by from a diverse range of demographics. Using a customised web interface on a tablet device participants were able to answer engagement questions, which in turn would be displayed