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OWNING THE CITY: NEW MEDIA AND CITIZEN ENGAGEMENT IN URBAN DESIGN

Over the last few years, the term “smart cities” has gained traction in academic, industry, and policy debates about the deployment of new media technologies in urban settings. It is mostly used to describe and market technologies that make city infrastructures more efficient, and personalize the experience of the city. Here, we want to propose the notion of “ownership” as a lens to take an alternative look at the role of urban new media in the city. With the notion of ownership, we seek to investigate how digital media and culture allow citizens to engage with, organize around and act upon collective issues to engage in co-creating the social fabric and built form of the city. Taking ownership as the point of departure, we wish to broaden the debate about the role of new media technologies in urban design from an infrastructural to a social point of view, or from “city management” to “city making”.

1. Introduction

In today’s cities, our everyday lives are shaped by digital media technologies such as smart cards, surveillance cameras, quasi-intelligent systems, smartphones, social media, location-based services, wireless networks, and so on. These technologies are inextricably bound up with the city’s material form, social patterns and mental experiences. As a consequence, the city has become a hybrid of the physical and the digital. This is perhaps most evident in the global north, although in emerging countries, like Indonesia and China mobile phones, wireless networks and CCTV cameras have also become a dominant feature of urban life (Castells, *et al.*, 2004; Qiu, 2007, 2009; de Lange, 2010). What does this mean for urban life and culture? And what are the implications for urban design, a discipline that has hitherto largely been concerned with the city’s built form?

In this contribution we do three things. First, we take a closer look at the notion of “smart cities” often invoked in policy and design discourses about the role of new media in the city. In this vision, the city is mainly understood as a series of infrastructures that must be managed as efficiently as possible. However, critics note that these technological imaginaries of a personalized, efficient and friction-free urbanism ignore some of the basic tenets of what it means to live in cities (Crang and Graham, 2007).

Second, we want to fertilize the debates and controversies about smart cities by forwarding the notion of “ownership” as a lens to zoom in on what we believe is the key question largely ignored in smart city visions: how to engage and empower citizens to act on complex collective urban problems? As is explained in more detail below, we use “ownership” not to refer to an exclusive proprietorship, but to an inclusive form of engagement, responsibility and stewardship. At stake is the issue of how digital technologies shape the ways in which people in cities manage coexistence with strangers who are different and who often have conflicting interests and, at the same time, form new collectives or publics around shared issues of concern (see, for instance, Jacobs, 1992; Graham and Marvin, 2001; Latour, 2005). “Ownership” teases out a number of shifts that take place in the urban public domain characterized by tensions between individuals and collectives, between differences and similarities, and between conflict and collaboration.

Third, we discuss a number of ways in which the rise of urban media technologies affects the city’s built form. Much has been said and written about changing spatial patterns and social behaviors in the media city. Yet, less attention has been paid to the question of how urban new media shape the built form. The notion of ownership allows us to figure the connection between technology and the city as more intricate than direct links of causality or correlation. Therefore, ownership in our view provides a starting point for urban design professionals and citizens to reconsider their own role in city making.

Questions about the role of digital media technologies in shaping the social fabric and built form of urban life are all the more urgent in the context of challenges posed by rapid urbanization, the worldwide financial crisis that hits particularly hard on the architectural sector, socio-cultural shifts in the relationship between the professional and the amateur, the status of expert knowledge, societies that face increasingly complex “wicked” problems, and governments retreating from public services. When grounds are shifting, urban design professionals as well as citizens need to reconsider their own role in city making.

1 In the words of a company that sells Near Field Communication solutions, this will produce an “effective personalization of the physical world”. Source: <http://www.nearfieldcommunication.com/business/overview/>, accessed 23 September 2012.

2 See also numerous special journal issues about smart cities, like *Journal of Urban Technology* (volume 18, number 2, 2011); *Urbanist* (number 517, 2012); *Journal of the Knowledge Economy* (volume 4, number 2, 2013); *Economist* (27 October 2012).

2. Recounting the role of urban tech: From smart city to social city

2.1. The personalized and efficient city

Urban media technologies stimulate a profound personalization of city life on spatial, social, and mental levels (Ling, 2008; Paulos, et al., 2008; de Lange, 2010, pp. 179–183; Dourish and Bell, 2011; de Waal, 2012a). For example, on the spatial level GPS-enabled devices and navigation software enable quick familiarization with unknown terrain. On location-based platforms users check-in at particular locales, quickly grasp what is there and build up personal relationships with places (like becoming “mayor”). Developments of what is known as the *Internet of Things*, or *Ambient Intelligence*, allow the automation of physical environments to respond to individual preferences¹. On the social level, mobile communications allow people to continually keep in touch with their in-group (Licoppe, 2004; Ito, 2005), imagine a sense of nearness and intimacy (de Gournay, 2002: pp. 201–204; Fox, 2006, p. 13), and solidify established relationships with friends and family at the expense of weak ties and strangers (Ling, 2008, pp. 159, 182). On the mental level, mobile devices with their multimedia capabilities allow people to create highly idiosyncratic images of the city (Bull, 2005; de Lange, 2009, p. 66). Listening to music on one’s mobile device, for example, generates – in the words of one of Michael Bull’s respondents – the “illusion of omnipotence” (Bull, 2005, p. 175). These media thus foster an individualized “sense of place”, a feeling of being part and in control of a situation (Meyrowitz, 1985).

The push towards an efficient and personalized city is institutionalized on a much larger scale in smart city policies (Mitchell, 1999; Mitchell, 2006; Hollands, 2008; Allwinkle and Cruickshank, 2011; Ratti and Townsend, 2011; Chourabi, *et al.*, 2012)². Municipalities form alliances with technology companies and knowledge institutions with the aim to organize urban processes efficiently (for a recent research/policy agenda see Batty, *et al.*, 2012). Sensor and network technologies gauge and optimize energy and water supplies, transport and logistics, air and environmental quality. The hope is that this improves the quality of life and that it helps to tackle some of the big future challenges that cities face. Companies that work on smart city strategies include IBM, CISCO, General Electric, AT&T, Microsoft and Philips.

Examples of actual “smart cities” include towns built from scratch like New Songdo in South Korea and Masdar in the United Arab Emirates, but

more often existing cities that are made “smarter”, like the Amsterdam Smart City project in the Netherlands.

2.2. Critique

As we note elsewhere (de Lange and de Waal, 2012a), the omnipresence of new media in an urban context has come under criticism along three broad lines. First, observers note that wayfinding devices, location-based services, digital signage, and customer loyalty cards transform our cities into consumer-optimized zones, while simultaneously producing exclusionary practices of “social sorting” (Crang and Graham, 2007; Shepard, 2011; de Waal, 2012a, 2013). Second, omnipresent cameras with face and gait recognition software, RFID-based access cards, smart meters, connected databases, and mobile network positioning, push cities toward revived “big brother” scenarios of pervasive institutional control and surveillance (Crang and Graham, 2007; Greenfield and Shepard, 2007; Lyon, 2009). Third, mobile screens, portable audio devices and untethered online access to one’s familiar inner circle enable people to retreat from public life into privatized tele-cocoons, bubbles or capsules (Cauter, 2004; Habuchi, 2005; Bull, 2005; Ito, *et al.*, 2009). In these scenarios, city dwellers no longer engage with strangers around them. There is a lack of space for spontaneous encounters and public life, and a general lack of involvement with the immediate environment.

Additionally, “smart city” developments take the technology lab as the starting point. The actual city is seen as the last and most difficult hurdle in successive phases of “deployment” or “roll-out”, rather than the sole place where experiment truly proves its value. Smart city projects typically consist of a “triple helix” of government, knowledge production (*e.g.* universities) and industry. Such consortia often ignore the role of citizens as equally important agents. At best, citizens in smart city policies are allowed to provide feedback somewhere in the design process, although oftentimes they figure as “end-users” instead of being engaged in the early stages of co-creation.

Artists and media activists have used these same media technologies to question and subvert the logic of the three Cs of consumption, control, and capsularization (de Lange and de Waal, 2012b) and approach urbanites as citizens rather than as consumers or end-users. This often happens through ludic interventions that hark back to Situationist legacies of *dérive* and *detournement* (Debord, 1958; Chang and Goodman, 2006; Charitos, *et al.*, 2008; de Waal, 2012b). While we believe such criticisms are valuable, many remain highly temporary and stick to an oppositional politics. How can we use the potential strengths of urban technologies to help

³ Manuel Castells distinguishes between the dominant “legitimizing identity”, the counter-active “resistance identity”, and the affirmative “project identity” (Castells, 1997, pp. 7–8).

⁴ See the documentation on the international workshop and conference “Social Cities of Tomorrow”, organized by The Mobile City, Virtueel Platform and ARCAM, 14–17 February 2012 in Amsterdam, www.socialcitiesoftomorrow.nl.

forge more durable “project identities”³? We argue that an alternative take on urban design with digital technologies is needed that focuses on the active role of citizens and uses the city itself as the test bed for experiments.

2.3. “Social cities”

Another tale – still under construction – has recently risen to the fore. In this vision, urban technologies engage and empower people to become active in shaping their urban environment, to forge relationships with their city and other people, and to collaboratively address shared urban issues (Paulos, *et al.*, 2008; Foth, *et al.*, 2011; de Lange and de Waal, 2012b). The focus in these discussions is on “social cities”, rather than on “smart cities”⁴. It explores how digital media technologies can enable people to act as co-creators of livable and lively cities. This narrative is inspired by the body of literature that describes profound shifts in the balance between production and consumption: from the professional amateur to wisdom of the crowd, from do-it-yourself culture to the hacker ethic (Himanen, 2001; Leadbeater and Miller, 2004; Benkler and Nissenbaum, 2006; Shirky, 2008; Rheingold, 2012). Central is the question of how collaborative principles and participatory ethics from online culture can be ported to the urban realm in order to coordinate collective action and help solve some of the urgent complex issues that cities are facing.

What are these issues, then? They exist on multiple scales. Some have a global scope, like social equity and environmental sustainability, or adequate water, food and energy supplies. Others are specific to particular cities, like shrinking cities, aging populations and empty spaces. On an intermediary level, many cities in the world face challenges such as the perceived decline of publicness, safety, social inclusion and cohesion, and the gap between citizens and policy. Typically, such issues are not “owned” by a single party. They are collective issues that involve multiple stakeholders and require forms of collaborative governance to tackle them. What is common for these issues is that short and long term interests of different stakeholders diverge. As a result, it is hard to establish a common definition of the problem itself, let alone find a solution everyone agrees on. Moreover, a single intervention may catalyze unforeseen events that alter the initial state. Because of this complexity, such issues have been called “wicked problems” (Rittel and Webber, 1973).

3. Ownership: Engaging citizens with new media

We want to contribute to the social city discourse by advancing the notion of “ownership” as a lens to look at how cities are made and remade with the help of digital media. “Ownership” acts as a heuristic device to make sense of the variety of developments that can be grouped under the social city label. We use ownership to refer to the degree to which city dwellers feel a sense of responsibility for shared issues and are taking action on these matters. As such, it is a “hack” of ownership in everyday parlance as being the proprietor of something, which gives the possessor the right to exclude someone else. When understanding ownership in more inclusive terms it means that one has the right to act upon an issue. It is this sense of ownership that we are after: not a contractual, proprietary ownership, but a sense of belonging to a collective place, commitment to a collective issue, and willingness to share a private resource with the collective in order to allow other citizens to act without infringing on other people’s right of ownership. In Lefebvre’s terms this is the right to appropriation, which is clearly distinct from the right to property (Lefebvre, 1996, p. 174; Mitchell, 2003, p. 18; Pugalís and Giddings, 2011, p. 282).

What is the advantage of looking at urban issues as ownership questions? It highlights how in cities there often is a discrepancy between formal juridical rights on individual or institutional levels and a collective sense of responsibility for the lived environment. As said, ownership can have an exclusive meaning as proprietorship (“mine not thine”) with passively conferred rights. This is the case with purely private matters and purely public matters for which the state is the sole responsible body. Ownership can also have an inclusive meaning that involves stewardship of what belongs to all of us. It then demands a stance of collective engagement and action. This inclusive and active notion of ownership underlines that city life is not just a matter of avoiding friction but also requires the willingness to affect, that is to touch upon things and other people and to set something or someone in motion (Thrift, 2004; de Lange, 2013).

Another advantage is that ownership offers a fresh take on existing models for citizen engagement. The idea of engaging citizens in shaping their living circumstances is of course not new. In many western countries it has been around since the 1970s. Among town planners, for example, “place making” has been a popular concept, whereby local people have their say within a community-driven process (Beyea, *et al.*, 2009). Policy-makers, housing corporations, politicians and knowledge institutes have also taken up the subject of citizen engagement. We can identify two extremes: a top-down participation model and a bottom-up community model. Policy institutions use participation models to initiate projects in which

citizens are invited to have a say, like in a town hall meeting. Some critics dismiss this as “pseudo-participation” (Miessen, 2010), which is reminiscent of what Arnstein has called “tokenism” (Arnstein, 1969). Politicians and government authorities give participation a nostalgic sugarcoating of inclusivity, democratic decision-making and solidarity. In doing so, they are “offloading” their own responsibilities (Institute for the Future, 2010). This is especially urgent in the context of the “Big Society” policy concept devised by the U.K. Conservative party, which seeks to shift from big government to “a political system where people have more power and control over their lives” (Conservative Party, 2010, p. ix).

The community model attempts to foster a sense of togetherness that has roots in physical proximity or virtual presence of homogenous groups of people who share key aspects of their lives. It upholds ideals of neighboring, localness, small-scale, similarity and simplicity. However, Jane Jacobs, among others, pointed out that city dwellers typically reject small-town parochialism. Or as she outspokenly put it:

“Togetherness” is a fittingly nauseating name for an old ideal in planning theory. This ideal is that if anything is shared among people, much should be shared. “Togetherness”, apparently a spiritual resource of the new suburbs, works destructively in cities. The requirement that much shall be shared drives city people apart. (Jacobs, 1992, p. 62)

In her view, cities offer citizens the advantage to escape narrow social control of the small village, and obtain the freedom to choose their own lifestyles.

With the notion of ownership, we position ourselves in response to earlier investigations of using ICTs for urban issues in what has been called “community informatics” (Gurstein, 2000, 2003; Keeble and Loader, 2001; Foth, 2009: p. XXIX; Shin and Shin, 2012). While we continue in the line of thought that ICTs can be used to help solve shared issues, we disagree on the centrality of the notion of community. Shin and Shin, for example, note that the notion of community is morally charged and problematic, yet argue for community as an ideal to keep striving for: “[P]ursuing community is not merely an idealistic, utopian project; rather, it is a realistic requirement for life” (Shin and Shin, 2012, p. 28). Community, we believe, need not be the sole or even necessary precondition to act on collective issues. In our view community is too reminiscent of small-scale and local ways of life rather than of contemporary urban life. Instead, we prefer the use of “networked publics” (Varnelis, 2008), groups of people who

5 See also Latour, 2005, p. 114. convene around a shared “matter of concern” in entities that may be more fleeting, composed of differences, rather than being based on sameness, and organized in distributed networks rather than in “natural” social bonds of locality, class, ethnicity, cultural identity, and so on⁵.

Importantly, complex urban issues often transcend purely local interests. Tenacious urban issues involve a complex of stakeholders, composed of citizens themselves, but also authorities and policy-makers on multiple levels, housing corporations, a wide array of social organizations and knowledge institutes involved in urban affairs, as well as local and global businesses. Ownership provides a horizon for action in which each stakeholder reciprocally contributes to the whole on a different but equal base.

Thus, with ownership we seek to overcome the parochialism inherent in bottom-up community models and the paternalism of top-down institutional participation policies. How can new media enable a more participatory kind of city making, without falling in the trap of either those participation models in which nothing essentially changes, or the anti-urban ideals of localism and “small-is-beautiful” implied by community models? The advent of digital media technologies in the urban sphere offers opportunities to organize citizen engagement neither in a local bottom-up nor an institutionalized top-down fashion, but in networked peer-to-peer ways. Instead of seeking consensus, these tools allow room for managing differences. We have seen how urban new media are often perceived to alleviate and eliminate moments of uncertainty and tension inherent to urban life. It is easy to understand how that threatens what, according to prominent urban theorists, is the city’s fragile quintessence, namely living among strangers and dealing with differences and serendipitous situations (Simmel, 1997; Wirth, 1938; Jacobs, 1992; Milgram, 1970; Sennett, 1976). We should note, however, that there is nothing inherently new (or wrong *per se*) with personalizing and smoothing out the city. Since the rise of the early modern metropolis, urbanites in one way or another have tailored the city to their individual preferences. People orient to familiar physical elements to feel more secure (Lynch, 1960). They play intricate social avoidance games of disengagement, distraction and deceit (Goffman, 1959; Lofland, 1973). They adopt blasé attitudes as a way to cope with sensory overload (Simmel, 1997; Milgram, 1970). The challenge in our view, therefore, is to balance these stories of personalization and efficiency on the one hand and to build collectives based on differences and mutualism on the other hand. Individuals must not only devise avoidance strategies, but also cooperate in order to address the more complex issues that are part of city life.

⁶ See, for instance, Apps for Amsterdam (www.appsforamsterdam.nl/en).

4. Promising developments for strengthening citizen ownership

As mentioned, “ownership” is related to social policies that have been around since the 1970s. Nonetheless, we argue that new media afford several promising qualitative shifts with regard to the way people engage, empower, and act, and in addition how they manage shared issues and resources. First, on the level of resources and issues, “big data” and urban media allow for collective issues to be named and made visible in new ways. Second, on the level of engagement, media art projects contribute to a “sense of place”, allowing people to see themselves as part of the urban fabric. Third, media technologies empower new “networked publics”: groups of people who organize themselves around collective issues. Fourth, in what can be called “DIY urbanism”, media technologies allow citizens to act in new ways, for instance design their own city and collectively govern urban affairs.

4.1. Resources and issues: The rise of a data commons

A current development is considering the city as an information-generating system. A variety of technologies collect an enormous amount and range of data. Consciously or unconsciously, citizens contribute to the accumulation of data through their uses of all kinds of products and services. As these data are being aggregated, they may become a “data commons”: a new resource containing valuable information for urban designers. Datasets can be used to bring out, visualize and manage collective issues. Preconditions for the establishment of a data commons include the availability of and access to open data, and the skills citizens have to use the data in a meaningful way. With the notion of ownership in mind one issue at stake is who has possession rights over these data. Are these a limited number of players (mostly governmental authorities and private companies) or can citizens, too, have access to these data in order to create interesting new applications and services. Examples include a number of app contests that have been organized by various municipalities in the Netherlands based on open data sets⁶. Not only is it possible to use aggregated data about urban practices to visualize collective issues, but it is also possible to bring out individual contributions and usage of resources.

4.2. Engagement: Sense of place

To engage people with communally shared issues, it is essential that people envision themselves as part of the urban fabric, and understand that their individual actions make a difference to the common good. They also need to trust other urbanites to act accordingly. Digital media can play an

important part in this, and engage citizens in new ways. Various experiments have been done with this. Art projects, like *Urban Tapestries* or the Dutch *Het geheugen van Oost* (*The Memory of Amsterdam East*), collect stories from various citizens and function as an exchange platform for these. Other projects such as Christian Nold's *Biomapping* act as provocative conversation pieces. Nold's installation collected biometric data from citizens while walking across town. The results – sudden spikes in heart rate or galvanic skin response – were used to engage locals in discussions about these places and the sensations they produced in them. Placeblogs have started to play a role in mapping diverse local initiatives in a particular area and by doing so produce a site where some of the stories of different people may start to overlap (Lindgren, 2005).

4.3. Publics: Networked publics

“Networked publics” are groups of people that use social media and other digital technologies to organize themselves around collective goals or issues (Varnelis, 2008). In online culture, networks of “professional amateurs” create “user generated content” or take part in “citizen science” projects. Think of open source software or Wikipedia as successful examples. In cities we have seen a growing interest in organizing publics in such a way, either to collectively map issues as part of activism, or to organize themselves around common pool resources. The Dutch Geluidsnet is an example of the former, where citizens who live near Schiphol airport in the Netherlands started a campaign against excessive airport noise pollution. Participants set up a mesh network by installing sound sensors in or around their houses. This data was collected and aggregated to produce a body of facts that could be used as counter-evidence in their case against the airport. Lately, we have seen a great interest in the organization of publics around so-called “common pool resources” (Ostrom, 1990). These vary from car sharing and tool lending to urban gardening. What is new, is that digital media make it easier to register individual contributions and usage of collective resources, and the reputation systems that emerge from these patterns may prevent the proverbial “tragedy of the commons” (Hardin, 1968). What both these new interfaces have in common, is that they make it easier to take a collective ownership into an issue or a common resource.

4.4. Act: DIY urban design

Digital media have enabled mechanisms for managing collective action. Traditionally, collectives suffer from a lack of information leading to less than optimal decision-making, which hampers action. With mobile and

location-based media, people can share more information more quickly and base adaptive decisions on it. Examples are the real-time exchange of information about air quality using portable sensors and mobile networks, or aggregated location-based information that allows predicting and providing information about traffic congestion. The terms “co-creation” and “crowdsourcing” are used for collective issues being tackled and managed collaboratively, with new participants having an active role. An interesting project is *Face Your World* by artist Jeanne van Heeswijk and architect Dennis Kaspori. Young people and other people living in an Amsterdam neighborhood collaborated in designing a city park using a 3D simulation environment in which they could upload their own images and ideas to debate amongst each other. With this crowdsourced plan, they managed to persuade the local government to abandon the initial plans for the park and execute theirs instead. Like online counterparts that successfully manage collective action (from Wikipedia to the Linux kernel), it would be an illusion to view these phenomena as exclusively bottom-up processes. They require curatorship and sets of rules. These rules are oftentimes enforced not by singular top-down institutions, but through distributed forms of supervision and sanctions organized by users themselves.

4.5. Limitations of “ownership”

The lens of ownership also brings out a number of problematic issues with regard to the social organization of urban life with the help of new media. Many of the examples above are still anecdotal. Others have their origins in the domain of art. Both show that urban media do have the affordance to promote “ownership”. However, the examples provided also raise pertinent and interrelated questions: What is the effectiveness or social merit of these interventions and how do we institutionalize these new forms? Once new urban issues have been visualized, and an initial interest or sense of engagement is aroused, how can publics organize in a productive way around them? What legal and regulatory frameworks do we need, for instance, to allow citizens to produce their own energy in a collaborative structure and deliver their surplus to the grid? What new types of institutions are needed and how can the pitfalls of new utopian society-making be avoided? By taking these questions as points of departure, “ownership” can also be used as a design and policy approach that offers an alternative to the urban imaginary of “smart cities”.

⁷ For critical discussions, see Downey and McGuigan, 1999; Graham, 2004, pp. 3–24; Picon, 2008, pp. 32–34; de Lange, 2010, pp. 160–166; Tuters and Lange, 2013.

5. Implications for urban design: New media and the built form

The relationship between (digital) media technologies and the physical city has often been thought of in a straightforward, even simplistic manner. The relation has long been theorized in terms of a substitution effect, whereby ICTs eventually would make the physical urban form obsolete⁷. In this view, voiced by, for instance, McLuhan, Virilio, and Mitchell, ICTs would lead the city to become increasingly dematerialized, decentralized and ephemeral (McLuhan, 1994, p. 366, pp. 378–379; Mitchell, 1995; Virilio, 1997, p. 25). ICTs would cause the disappearance of concentrated functions from the city centers in realms such as commerce (Dodge, 2004), public institutions (Mitchell, 1995), and housing (de Sola Pool, 1977, pp. 141, 302). To be fair it should be added that de Sola Pool takes a more nuanced approach, rather than depicting technology's impact on the city as merely one-way. Despite its title, de Sola Pool and his colleagues make it consistently clear in *The social impact of the telephone* (1977) that the telephone is “a facilitating device” and that it “often contributed to quite opposite developments” (de Sola Pool, 1977, p. 302). The city and the telephone “mutually shape” or modify each other. The telephone (and the car) “were jointly responsible for the vast growth of American suburbia and exurbia, and for the phenomenon of urban sprawl. There is some truth to that, even though everything we have said so far seems to point to the reverse proposition that the telephone made the skyscraper possible and increased the congestion downtown” (Pool, 1983, pp. 43–44). Since the early 1990s onwards, a growing number of authors have pointed out that ICTs actually concentrate functions and people in cities. Cities are hubs for information networks, skills and knowledge in “global cities” and “technopoles” (Sassen, 1991; Castells and Hall, 1994) and for cultural industries in “creative cities” (Florida, 2004).

At the level of design practice, crude translations from observation to intervention frequently result in slavishly catering to some of the technological affordances discussed in the first section. For instance, in reaction to people working ubiquitously with their portable wireless devices, a host of spaces are adapted to nomadic labor by being equipped with Wi-Fi, power sockets and cocooning zones. Convenient as this may be for individuals, such a reactive, or even servile, attitude of urban design to the demands of “technological progress” avoids a more critical engagement that interrogates the desirability of such developments (de Lange and de Waal, 2009).

We believe it is necessary to explore alternatives to direct connections of causality or correlation between technology and the city. Ownership allows us to venture beyond relationships of amplification, substitution,

or modification, and take a more culturally sensitive detour that highlights new ways of co-creating the city.

For one, the data generated by the city can be used as variables in (parametric) design approaches. Architects and other professionals can and are already using these data to gain insight in spatial patterns of citizens, about their mental maps and emotional sense of well-being tied to particular places, or to learn about the presence or absence of particular subcultures to which designs can be tailored. Dutch architecture and research office Space&Matter harvested social network data to research a transformation plan for an old energy plant in Eindhoven. Through these searches, they found two subcultures of skaters and BMX bikers, and climbers. By investigating and comparing their respective spatial needs, they proposed to strike a balance in the reuse of the building by retrofitting it with perforations in the floor that would benefit both subcultures.

The data produced by the city and its inhabitants can be used to visualize collective issues in new ways that appeal to people's emotional attachment. For instance, there have been quite a few projects trying to visualize environmental issues, from MIT's Senseable City Lab's *Trash Track*, which follows the route of discarded objects, to the Medialab Prado's *In the Air*, which measures and displays air pollution. Most data visualization projects stay in the digital realm of "information architecture", turning data in beautiful visualizations. Some of them, however, jump over to urban architecture by experimenting with physical and tangible installations, rather than online maps or projections on museum walls. For *In the Air*, a prototype was developed for a fountain with colors and light intensity that reflect air quality. In the Dutch city of Doetichem artist Q.S. Serafijn and architect Lars Spuybroek created the D-Tower, an interactive light sculpture that reflects the mood of the city and which can be seen as an early exploration of an "architecture of affect" (see de Lange, 2013). The colors of the light installation (yellow for fear, green for hatred, red for love and blue for happiness) are determined by the outcomes of a daily online questionnaire amongst residents about their mood. As the project was finalized in 2004, it did not yet make use of any real-time information. It can be expected that in the near future many interactive installations, light sculptures and other objects will appear in the city to reflect, in concrete or more abstract ways, the real-time rhythms and emotions of the city or address particular issues (such as air pollution) that may arise from the data commons.

At the same time, we witness the emergence of new spatio-temporal types. For some time now, many cities have seen so-called "pop-up" events (pop-up bars, pop-up clubs, pop-up shops), often in vacant buildings and

underused sites (Schwarz and Rugare, 2009). Additionally, crowdfunded neighborhood buildings and infrastructures emerge that are sometimes literally built with second hand or discarded materials (an example in Amsterdam is <http://noorderparkbar.nl>). Often organized with a collaborative DIY attitude and with the aid of social media, these interventions shift focus from place making to creating temporary events. Their sudden appearance and impermanence underline the transient nature of urban places in an age of new media developments that occur on a completely different timescale from traditional architecture (de Lange and de Waal, 2009). Thus, the balance of architectural practice appears to shift from manipulating space to manipulating space in time. A case taken to the extreme is DUS Architect's Bubble Building made entirely out of soap bubbles. It is meant to stimulate playful interactions since visitors must collaborate to build the soap structure.

In these examples, we see how some of the tensions mentioned in the introduction – individual and collective, difference and similarity, conflict and collaboration – become materialized and reconfigured in architecture. The rise of urban data means it is much easier to find, build and live among people based on perceived similarities. This is partly true in the case of collective private commissioning (CPC), an official Dutch housing policy measure in place since 2000, which aims to stimulate end-users to collectively design and build their own homes, as they did prior to World War II, after which public housing became the task of national government, local authorities and semi-public housing corporations. CPC aims to fit the mobility and DIY attitude of the present network society, and “the need for a renewed collective self-esteem” (Boelens and Visser, 2011, pp. 105–106). While on the scale of the housing project, this may lead to homogenization, as likeminded people tend to cluster and choose similar designs, it may lead to a mosaic-like heterogeneity at the wider scale of neighborhoods. Nonetheless, it raises questions about who owns the city, as an evaluative study into ten years of CPC and variants finds: “[A]ccording to the residents questioned, there are some cases where (C)PC projects seem to be perceived as ‘different’ and ‘gated’. Although openness is often guaranteed, some are still regarded as outsiders”. (Boelens and Visser, 2011, p. 124).

In the above cases, traditional institutions are often bypassed. Architects adopt the roles of commissioner and executor at once. Rather than being demand-driven and waiting for a commission or entering competitions, they actively seek out an issue like the redevelopment or temporary use of a particular place and try to organize publics that take ownership. Instead of pitching, they campaign and mobilize networked

publics to realize their plans. This movement away from a demand-driven work ethic appears to have striking parallels with the intrinsically motivated playful hacker spirit of doing something just because it is fun (Himanen, 2001, pp. 3–7).

6. Conclusion

We have forwarded “ownership” as a lens to look at the role of new media technologies in the city, chiefly as an alternative to the smart city paradigm. We have shown how digital media have created a number of qualitative shifts in the way publics can be engaged with, organized around and act upon collective issues. These shifts mean that it has become easier for many citizens to organize themselves and take ownership of particular issues. In turn this may lead not only to new ways in which social life is organized, but also to new ways of shaping the built environment. We also argued that a culturally sensitive approach to the relation between city and technology is much needed. While many of these developments spring from grassroots initiatives and are organized around decentralized networks, they certainly are not without structure, rules and institutions. Of course we have to keep in mind that not everyone has access to these digital technologies, let alone is “net smart” enough to use them beneficially (Rheingold, 2012). Another issue for further debate is the ongoing struggle over control of infrastructures and data. Perhaps, this is a contribution architects and other urban designers can make to the world of new media design: to design truly accessible and inclusive urban interfaces that engage citizens with particular issues and allow to them to organize themselves and act.

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