COLOPHON

The Hackable City: A Research Manifesto and Design Toolkit

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Printer Offsetdrukkerij Nuance, Zaandam
Publisher Amsterdam Creative Industries Publishing, Rose Leighton
Supported by Amsterdam University of Applied Sciences (Hogeschool van Amsterdam), PublishingLab
Cover image Marc Faasse (www.ndsm.nl/speeltuin)
Photography Marc Faasse, Michiel de Lange, Pink Pony Express
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EPUB and PDF editions of this publication are freely downloadable from our website, www.publishinglab.nl/publications

Amsterdam, December 2015

ISBN 978-94-92171-04-7
ISBN 978-94-92171-05-4

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ACKNOWLEDGEMENTS

The Hackable City is a research project on the role of digital media in the process of citymaking that resulted from a cooperation between One Architecture and The Mobile City Foundation. The project investigates the opportunities of digital media technologies for the empowerment of citizens and other stakeholders in a democratic process of citymaking. It also explores the shift in roles of and relationships between governments, (design) professionals and citizens in this process.

The first contours for this project were laid out by One Architecture and The Mobile City during the Metropool NL workshop organized by the Deltametropool Society in 2012, resulting in the publication *Eindhoven, Hackable World City.* This was followed by an 'embedded researcher' project hosted at the University of Amsterdam and One Architecture and funded by the Creative Industries Research Centre Amsterdam, with contributions from Utrecht University. In 2014, funding was received from the Netherlands Organization for Scientific Research (NWO) for both a KIEM-exploration through Utrecht University and a Creative Industries research project hosted at the University of Amsterdam (UvA), The Amsterdam University of Applied Sciences (AUAS), and One Architecture. For the latter, new partners joined the research coalition: The Ministry of the Interior and Kingdom Relations, Pakhuis de Zwijger, and Stadslab Buiksloterham.

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self-sufficiency reflected in publications like The Whole Earth Catalogue (Levy, 2001; Turner, 2006). In the 1980s, 'hacking' receives a negative connotation in society at large, when it's associated with criminals who break into computer systems. Films like WarGames (1983), Blade Runner (1982), Tron (1982) and books like Neuromancer (1984) bring this image of the underground semi-criminal hacker into the domain of popular culture, demonstrating the vulnerable aspects of large technological systems. In the 1990s, the hacking community finds itself rehabilitated, as 'hacking' gains broader cultural leverage as a label under which open source programmers have started to collaboratively work on free software such as the Linux kernel, the web browser Mosaic or the online publishing tool Wordpress. Here hacking is interpreted as contributing one's knowledge and mastery over computer systems to the development of software for a common good, while at the same time showing off one's cleverness to do so to a group of peers.

More recently in our current decade, the term hacking has popped up in a similar way to describe a group of people who use computers, digital media and the internet in an effort to shape urban life from the bottom-up. In the introduction of his much-cited book on Smart Cities, Anthony Townsend describes the emergence of the 'civic hacker' as follows:

> "They eschew efficiency, instead seeking to amplify and accelerate the natural sociability of city life. Instead of stockpiling big data, they build mechanisms to share it with others. Instead of optimizing government operations behind the scenes, they create digital interfaces for people to see, touch, and feel the city in completely new ways. Instead of proprietary monopolies, they build collaborative networks. These bottom-up efforts thrive on their small scale but hold the potential to spread virally on the Web. Everywhere that the industry attempts to impose its vision of clean computer centrally managed order, they propose messy decentralized and democratic alternatives." (Townsend, 2013)

Townsend's description is not only the latest instalment of a description of historic hacker cultures, it also brings together many of the characteristics found in the various examples in a neat list of characteristics: hackers are not mere users of technology, but active creators, shapers, and benders of media technologies as well as the relationships mediated through them (see also: Levy, 2001; Roszak, 1986). They like to tinker with technology and cooperate on projects for a common good and prefer messy iterative operations above master plans. Hacking, in other words, refers to the process of clever or playful appropriation of existing technologies or infrastructures, and bending the operation of a particular system beyond its intended purposes or restrictions to serve personal or communal goals.

Hackers are not mere users of technology, but active creators, shapers, and benders of media technologies

For hackers, that approach is not just one out of many ways to solve a problem. For many of them it's a way of life. Many of the proponents in the examples given above wilfully make use of the term hacker as a communal badge of identity. To be a hacker not only means to playfully make use of systems beyond their intended logic, it encompasses a complete ethos: a particular way of understanding and operating in society.

It's the combination of these two aspects of hacking that we find interesting vis-à-vis the development of a 21st century collaborative design approach for citymaking. 'Hacking the city' is about finding ways to actively shape one's surroundings through the clever and playful appropriation of technology. And it could also be considered as a communal identity, a collective approach to citymaking that borrows a number of central tenets of the hacker culture. Although it would be naïve to consider the hacker community as a coherent whole, from which we could distil a single, consistent ethic, there are two central themes in the hacker ethic that for us are of particular interest: a culture of sharing and collaboration, and a tinkering, hands-on way to problem-solving.

HACKERS' STANCE ON INFORMATION: IT WANTS TO BE FREE

The first point is the attitude of hackers towards openness and sharing knowledge. If there's one central principle that runs through various accounts of hacker culture, it is unobstructed access to information (in the form of code) in combination to the freedom to build upon other people's work. 'Information wants to be free' is one of the leading adagios of hacker culture, although there is a controversy about how exactly that should be interpreted. In the 1980s, open software-evangelist Richard Stallman added an important nuance to this claim: 'Think free as in free speech, not free beer.' Free to him did not mean that all information would be accessible without any costs, but that users had the freedom to build upon, alter, change or hack into existing information structures. Such a freedom to information could lead to innovation, and thus contribute to a better world. As such the hacker ethic opposes the closed knowledge systems of patents and proprietary platforms. The more information is available, the better. As Stallman stated:

> "I believe that all generally useful information should be free. By 'free' I am not referring to price, but rather to the freedom to copy the information and to adapt it to one's own uses... When information is generally useful, redistributing it makes humanity wealthier no matter who is distributing and no matter who is receiving." (Stallman, quoted in: Denning, 1996)

The openness of systems has another advantage. In his seminal essay The Cathedral and the Bazaar' Eric Raymond (1999), one of the gurus of the open source software movement, explains the decentralized hacker-approach of being small and agile. It's that very ethic of small-scale initiatives in combination with cooperation with one's neighbours that allows the bazaar to respond to needs as they emerge. That is in contrast to the cathedral, which according to Raymond articulates the vision of a master builder, slowly becoming a masterpiece to dominate the urban landscape, yet tied to its original function and unable to adjust to changing circumstances. For Raymond, as for Stallman, not collaborating with peers in developing software was

We inventoried 84 such projects, varying from groups of people building their own homes, to citizens organizing themselves around local issues such as safety or health, to sharing economy initiatives. Our goal was to try to understand who initiated these projects, what the issues were they are occupied with, and how they tackled them.

Although many of these projects were initiated by citizens or professionals, many of them operated in cooperation with a variety of institutional stakeholders

Some of these projects were initiated by citizens, others by professionals. Some rely on voluntary actions, or are financed by state or city subsidies, others were set up as start-ups. Most of them employed both digital technologies as well as offline ways of organization through meet-ups and interventions in public space. They also operated on different scale levels: from the hyper-local to the global.

Through a survey, we identified the stakeholders involved in these projects as well as their goals and uses of digital media. About 70% of the projects that responded to our survey said they were initiated by a newly formed group of individuals, followed by 20% that were initiated by an existing community and 10% were either entrepreneurial or established by non-profit organizations. Many of these projects addressed a personal wish or urge of their initiators. For example Thuisafgehaald.nl was developed as a side project out of the wish of its initiators to share food with their neighbors and try out new homemade dishes. Others are quests for alternative modes of area development initiated by self-employed creatives that look for ways to operate outside traditional schemes. Examples are Glamourmanifest or Cascoland.

Although many of these projects were initiated by citizens or professionals, many of them operated in cooperation with a variety of institutional stakeholders. Many of the projects surveyed reported ties to the 'stadsdelen' (the administrative city government units operating at the level of city districts). The central municipality was also mentioned as stakeholder or partner, but significantly less than the *stadsdelen*, the official term for Amsterdam's City precincts. This shows that many of the projects surveyed are working in a decentralized framework. Of the non-governmental agents, Liander and Ymere stuck out. Liander is the largest utility company in the Netherlands, responsible for the management of the electricity and gas network, mainly in the northern part of the country. It is also a partner in many projects supported by the Amsterdam Economic Board and has initiated a number of energy-related small-scale pilots. Ymere is a housing corporation with a social profile that supports mainly citizen-initiated projects in areas where they manage a large proportion of the buildings.

The issues and goals these projects seek to address can be classified in a three (partially overlapping) main categories:

- A first group of projects seeks to advance a more sustainable management of resources, including themes of energy production and management as well as local food production, urban farming and exchange networks.
- A second group of projects aims to improve social cohesion. Their main objective is to bring people together and encourage them to interact, considering interpersonal interaction something positive on its own. The result is a variety of activities that range from yoga and language lessons to discussion groups, communal gardens and workshops. Neighborhood cultural centres or artistic projects are examples in this area.
- A third group of projects consists of projects that seek to improve the liveability of neighborhoods. These are usually tied to a specific location and aim to upgrade the local conditions. This can be people who gather in order to re-develop their areas, projects that address issues of mobility and access to and the care of the environment.

In our survey, the goal most mentioned was 'More efficient and sustainable resource management'. A large part of these projects deal with the theme of energy. This is either addressed by looking into alternative models of producing energy, e.g. by collectively installing solar panels or windmills or exploring different ways of managing the produced energy, for example by sharing locally produced energy. Many of these projects also try to monitor energy use and test possible applications of smart meters, dynamic pricing etc. on behalf of big energy companies. Many of the urban agriculture and farming projects fit in this category as well, since they also explore new ways to produce food locally.

There are also a large number of projects that have stated as their main goal 'to create or sustain a feeling of community among the inhabitants of a neighborhood' and 'improve social cohesion'. There are many different ways they try to do that, but they are mostly centred around a meeting place and the organization of common activities.

The main difference between these two types of projects lies mainly in who is behind them. Many of the energy projects are initiated or supported by large corporations and are used as pilots for the application of new technologies on a wider scale. In the case of the community building projects, the only large organizations involved are occasionally housing corporations, while the local governments are very often initiating or supporting them.

Seven of the 84 projects we have identified were chosen for an ~~depth~~ analysis through interviews and analysis of their media use and practices. These projects were chosen to represent a diverse cross section of the long list of projects, both in terms of theme as well as in organizational structure and the issue of who initiated them. These projects are:

- BSH5, a community of self-builders in Amsterdam North
- Farming the City, a research organization on urban agriculture,
- Join the Pipe, an organization campaigning for tap water drinking,
- Makers+Co, a designers' group empowering a local community,
- Peerby, a sharing economy start-up,
- Ring-Ring, a mobile phone app promoting cycling
- Verbeter de Buurt, a platform for reporting local problems and ideas.

Through the survey and the in-depth analysis we have constructed a taxonomy of phases we found in the 'hackable citymaking' process as well as a taxonomy of hackable citymaking strategies. We found that hackable citymaking projects go through seven phases, which range from defining the issue to engaging the public around it, providing this public with means to act and ways to institutionalize the city hack. This seven step model is comparable to existing models for social organization or living labs and can be reduced to a single question: How can the public be engaged around a communal issue and act upon it? What is specifically interesting for our research purposes is the role of new media in this process. We found that in many of these phases, they provide new means for the execution of that phase. Although not all projects go through all seven phases or follow the same order in doing so, we found this categorization useful as these seven phases reveal a number of (often implicit) design decisions that influence the ways a hackable city project is organized and hence its effectiveness. These seven phases will be discussed further down.

In addition, in order to be successful, we found that many hackable city projects make use of a variety of strategies. In the projects we studied, we came across eight recurring strategies. These strategies include the organization of knowledge communities to exchange knowledge and enable learning, the setup of trust-building mechanisms and the design of institutional frameworks. Again: not every project makes use of all of these strategies, and the way they do so may vary according to the needs of the project. This list of strategies is also far from exhaustive. Yet we found it insightful to describe eight of these strategies, as they may give organizers and designers of future projects some guidance of the kind of tools and strategies they could revert to. An overview of the strategies we found will be given below in the Hackable City Strategies-section.

In future research, the hackable city phases and hackable city strategies will be developed further. We have started here by singling them out and giving a first array of insights in the role of new media in these phases and strategies. In addition, we have added the description of seven case studies. Whereas our Toolkit (the combination of the Hackable City Phases and the Hackable City Strategies) describes phases and strategies in rather general terms, in the case studies we will describe how they were applied in a number of projects in more detail.

3 HACKABLE CITY PHASE ENGAGE

Description

In this phase, a larger public is to be engaged with the issue. It's about informing potential subjects about the issue and their potential involvement in it, as well as convincing them about its importance. This is not only about showing convincing rational arguments but also addressing the issue at an affective level.

The role of digital media

Social media are a new form of campaigning tools, allowing for 'spreadability' of engaging messages. Other new tools in this area are gamification and personalization tools. The former allows for playful opportunities to engage subjects, the latter can show to what extent an issue is affecting individuals, offering opportunities for identification.

Rezone the Game was a project carried out in Den Bosch that used playful interventions to engage the public with the issue of vacant industrial buildings. It allowed the public to playfully explore the site of a factory, providing them with a new, affective relationship to their environment.

Toon by Eneco is a smart display that publishes real time data about energy use, and allows clients to compare their use to neighbors or friends, providing them with objective information about energy conservation, and at the same time gamifying this goal into a 'comparison game'.

4 HACKABLE CITY PHASE REPRESENT

Description

Each public needs to find a way to represent itself, as well as a platform and protocols through which its members can communicate with each other. Strategies range from physical rallies and demonstrations in public space to the use of online discussion for a.

The role of digital media

New media provide all kinds of new ways for the representation of publics. The public can be made visible as an aggregate (how much energy have we saved / money have we raised/ bike kilometers have we travelled together), as well as a range of individuals (what are the characteristics / contributions of individual members). Individuals can be represented anonymously, as avatars, through existing social media accounts (e.g. a Facebook ID), with limited information about themselves revealed, or with full profiles. Reputation systems can also help audiences to build up trust.

There is no right or wrong here, just that different publics and different causes ask for different means of representations and means of privacy. Choices in the design of a mode of representation may affect the ways individuals can identify with fellow members of the public, or feel secure within in a community.

In of the sharing economy, reputation systems play an important part in the representation of the public, allowing fellow members of the public to evaluate past and potential collaborators. This may help to build up trust and enable individuals to work together on a communal goal. However it's use has also raised issues about privacy, opportunities to exclude members of different cultural or racial backgrounds as well as the instrumentalization of social relations.

Obscuracam is an app that lets people take pictures of crowds in which the faces of those present are scrambled. This way, the crowd can be represented (look how many of us there are!) without viewers being able to identify individuals within the crowd. Such a tool may come in handy in situations in which the powers that be may not be sympathetic to a crowd of demonstrators.

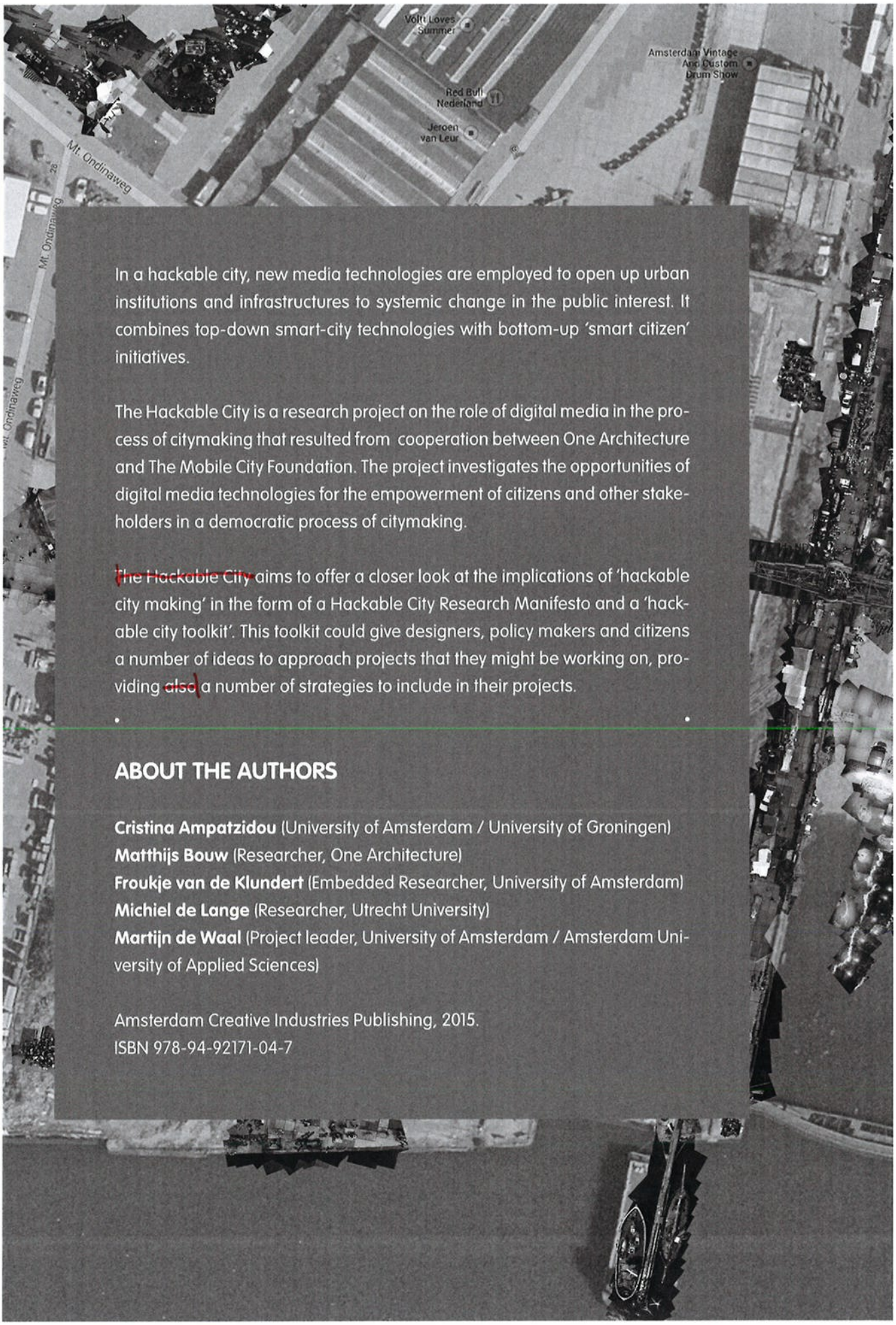
Sorry, afbeelding was beter. Omruilen?

CASE STUDIES

CASE STUDY BSH5

BSH5 is an informal group consisting of the self-builders (a Dutch term referring to individuals who are building their own homes, an uncommon practice in the Netherlands due to regulation) of 18 small plots on a collective lot ('Lot 5') in Buiksloterham, a brownfield redevelopment in the northern part of Amsterdam. Since 2011, BSH5 is organized via personal meetings, a website and a mailing list that allows the group members to coordinate their activities and exchange experience. Their objective is not only to develop their individual houses, but also to contribute design suggestions for the neighbouring public space, a community centre, a shared warehouse, as well as to create temporary urban gardens in empty pieces of land and to create a 'dream atlas', a repository of ideas about Buiksloterham.

The Municipality of Amsterdam decided to allocate several plots of land in the former industrial area of Buiksloterham for development by individual users on the basis of a 50-year lease. Early adopters of this development model, such as those in Lot 5, were mostly architects and designers. Their professional occupation allowed them to appreciate the opportunity and estimate the necessary time and costs involved. The initial success of Lot5 led to the allocation of several other lots of varied sizes, with a higher diversity of involved self-developers. In 2013, it was estimated that about 210 houses and apartments would be self-build in the Buiksloterham area. According to Martijn Meester, owner of one of the plots in Lot5, getting together to form a group emerged out of necessity. All future inhabitants were encouraged by the Municipality to come together and figure out how they could profit from their collaboration. Their collaboration was partly meant to coordinate major building activities and practical things, such as laying the foundations and negotiating better prices for building materials with retailers. Resources concerning sustainable building solutions, energy provision, materials and even the designs of the houses are collected in the BSH5 website, which also hosts a blog with news about the building process. Evidently, this community was not formed out of an ideal about 'knowing your neighbours' but



In a hackable city, new media technologies are employed to open up urban institutions and infrastructures to systemic change in the public interest. It combines top-down smart-city technologies with bottom-up 'smart citizen' initiatives.

The Hackable City is a research project on the role of digital media in the process of citymaking that resulted from cooperation between One Architecture and The Mobile City Foundation. The project investigates the opportunities of digital media technologies for the empowerment of citizens and other stakeholders in a democratic process of citymaking.

~~The Hackable City~~ aims to offer a closer look at the implications of 'hackable city making' in the form of a Hackable City Research Manifesto and a 'hackable city toolkit'. This toolkit could give designers, policy makers and citizens a number of ideas to approach projects that they might be working on, providing ~~also~~ a number of strategies to include in their projects.

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Amsterdam Creative Industries Publishing, 2015.
ISBN 978-94-92171-04-7