The Hackable City. Cahier #2

design probes for the Hackable City in Amsterdam Buiksloterham

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THE
HACKABLE
CITY

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Researchers from The University of Amsterdam, The Amsterdam University of Applied Sciences (Play & Civic Media), Utrecht University, and two embedded researchers hosted by One Architecture contributed to the project.

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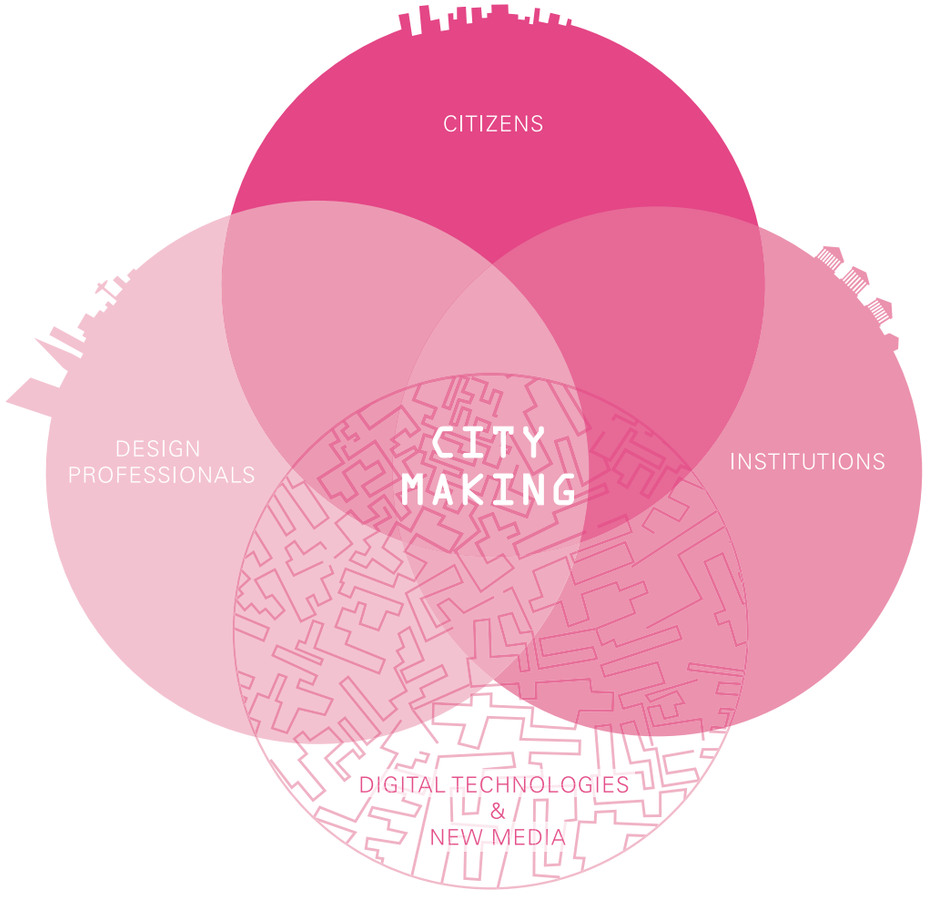
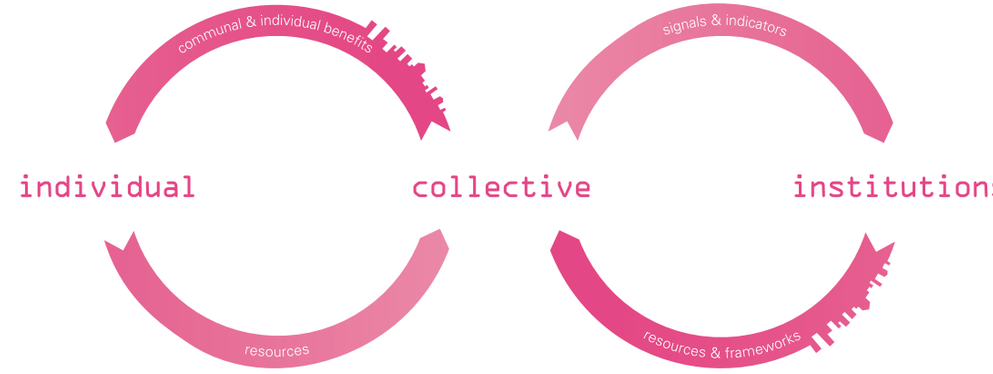
The Hackable City (normative definition):
In a hackable city, new media technologies are employed to open up urban institutions and infrastructures to systemic change, in the public interest. It combines top-down smart-city technologies with bottom-up 'smart citizen' initiatives.

The Hackable City (research project):
The goal of this research project is to explore the opportunities, as well as challenges, created by the rise of new media technologies for an open, democratic process of collaborative citymaking.
How can citizens, design professionals, local government institutions and others employ digital media platforms in collaborative processes of urban planning, management and social organization, to contribute to a livable and resilient city, with a strong social fabric?





Hackable citymaking revolves around the organization of individuals into collectives, often through or with the aid of digital media platforms. Individuals contribute resources, such as knowledge, time, information or money, and at the same time reap some form of reward, be it social, economic or political, on an individual or communal level.

These collectives are often (though not always) initiated and managed by professionals who have started to broaden their fields of work. They are no longer 'just' designers, but have taken up the role of community organizers, fundraisers, storytellers, project developers, etc.

Collectives are propelled by collective narratives and agendas and need a value or business model to be sustainable over time.

The collectives act within legal and democratic frameworks, often making use of resources or infrastructure provided by the city at large. Hackable citymaking makes this relationship between collectives and institutions interactive. How can the city's governing and administrative institutions learn from these collectives' initiatives, and when they contribute to public value, adjust their frameworks accordingly?

Introduction

During the period between April 2015 and July 2016, researchers from The Hackable City-project, and the project partners, developed a series of experiments in Buiksloterham, a neighborhood and brownfield redevelopment site in Amsterdam. Each of these experiments was tailored to explore a specific aspect of what we call 'hackable citymaking'. We designed a city game that facilitated collaboration between local stakeholders involved in the development of the area. An app was developed to act as a knowledge platform for self-builders, we drafted a set of criteria to evaluate collaborative area development by building groups; and a game, and a playful workshop, were created that invited local residents to start thinking about the collective management of commonly held resources.

The goal of this diverse set of experiments, or 'design probes' as we'd like to call them, was to gain insight in the challenges and opportunities for collaborative citymaking. Some of these probes can be understood as an initial exploration of tools that can be used to open up the process of citymaking. Others were designed as a process to provoke discussions and reflections on collaborative development.

Together they informed our research on what we started to call 'the hackable city': a city in which new technologies are employed to open up urban institutions and infrastructures to systemic change in the public interest. Could this vision be realized? What roles can citizens, professionals and policy makers assume in this process, and what tools and frameworks are needed?

In *Cahier #2 Design Probes for the Hackable City in Amsterdam Buiksloterham* we share lessons learned from these processes. The focus is on practical insights, and their implications for design. A more abstract hackable city-model, based on our explorations in Buiksloterham, is described in greater detail in *Cahier #1 The Hackable City: a model for collaborative citymaking.* In addition, *Cahier #3 The Hackable City International: lessons from Athens, Sao Paulo and Shenzhen* presents findings on related practices in citymaking in these three major cities.

The neighborhood Buiksloterham, in Amsterdam, is an interesting test-site to explore hackable citymaking practices. Buiksloterham is a historic industrial site known for its shipbuilding wharves and smokestack industries. By the 2000's much – although by far not all – industrial activity had relocated, and plans were introduced to redevelop the site into a combined working-living quarter, including at least 9,000 houses and apartments. However, in the wake of the financial crisis of 2008, the traditional Dutch top-down developer-led model used in Buiksloterham came to a halt. Developers pulled out, and many lots were left undeveloped, with hardly any takers interested.

This created opportunities for alternative approaches toward development. A number of lots were reassigned for development by individual self-builders or by collaborative building groups, thus opening up the development of the area to new parties. On one lot, a small number of professionals launched an experimental site for investigating the circular economy. Partly inspired by its success, a larger network of residents, institutions and companies formed around the vision to collaboratively turn Buiksloterham into a 'Circular Neighborhood'. The local government stated in its zoning plan their ambition to re-develop the neighborhood 'organically'; and co-signed a manifesto that called for the circular development of the area. This entailed a small (local)-scale closed loop re-use of various resources, including water, energy, building materials, etc. Local stakeholders started to envision Buiksloterham as a 'living lab' – in which new models and technologies for a circular economy, as well as cooperative development, could be tested.

Two of our research partners were already working in the area. Architecture and urbanism practice One Architecture was an active agent in developing Buiksloterham via a collaborative building group, and at the same time were making plans to build a bio-refinery. Stadslab Buiksloterham (Citylab Buiksloterham) was another local partner interested in creating sustainable models for cooperative development. Our project was additionally supported by the Ministry of the Interior, and Pakhuis de Zwijger; two institutions also interested in exploring alternative, collaborative visions for citymaking.

Research themes: (collaborative) self-building & area development, and water & the commons.

To bring focus to our research on hackable citymaking, the team decided to concentrate on two issues: (collaborative) self-building & area development, and water & the commons. Both themes were prominently discussed in the local community by stakeholders. At the same time, these topics also provided two different perspectives on a central hackable city theme: the organization of collectives around private, collective and public value creation. Self-building starts as a private interest, and then often evolves into a collective one – and could contribute to, or even be in conflict with public values. Self-builders and collaborative building groups may organize themselves in order to empower themselves, or collaborate around issues like foundation pile driving, renewable energy provisions, or the management of public spaces. They experiment with innovative building methods that have the potential to benefit society at large. How can these lessons be shared with a larger community, and how can their contributions to public values be recognized, valued and stimulated?

On the other hand, water management is an issue that is usually understood as a public utility, for which the municipality is responsible. In this case there is little need or motivation for individuals or collectives to organize around water issues. What happens when water becomes understood as a (circular) collective good – a 'common pool resource'? Collective goods are frequently subject to what is known as the 'tragedy of the commons' (private gain, collective pain). However, by investing in circularity, individual initiatives easily face an inverse version of this tragedy (private pain, collective gain), thus de-incentivizing such investment. This happens, for instance, when individuals invest in making their own house 'rainproof', e.g. by retaining rain water through the construction of green roofs or water tanks. This is usually a private investment, but everyone in the area benefits. Under what conditions and provisions is it conceivable that citizens initiate and contribute to these types of collective and public goals?

Research through design

We deployed a number of established academic research methods, including ethnographic observations, interviews, and discourse analysis of various documents published by local stakeholders. These helped piece together a broad overview of the area, it's issues, it's stakeholders, and their interests. In addition, we employed new approaches based on designing small interventions through which we aimed to test a number of assumptions about collaborative citymaking. These interventions also helped provoke a debate about some of the central issues. This allowed us to become active agents within the setting itself, and reflect on this directly, rather than assume a disengaged academic stance, by pretending that our presence did not influence the field, and outcomes. By locating two 'embedded researchers' at One Architecture, we could observe developments up close, contribute to the development of tools needed for collaborative citymaking, and reflect on the larger organizational implications and shifting roles and relationships between citizens, professionals, and government.

We were inspired by a research through design approach (RtD). As defined by design researcher Zimmerman and his colleagues in a seminal paper, this approach can be understood as 'the process of iteratively designing artifacts as a creative way of investigating what a potential future might be.'[1] In a RtD-approach, designers create artifacts that are not intended as a mere solution for a stated problem. Instead, these artifacts lead to new insights in both the nature of the problem, while also provoking discourse about the 'preferred state' that is to be brought about; and help shine a light on the solutions that could be used to bring that preferred state about. In our case, this approach helped us understand the needs, interests and perspectives of various stakeholders (understand the 'problem space'

around collaborative citymaking), get insights in concrete tools that they could use to collaborate (possible solutions), as well as catalyze further discussions on the guiding principles for a hackable city (the preferred state).

Two methods were specifically inspirational for us. The first is 'cultural probing', an idea introduced by Bill Gaver and his colleagues at the end of 1990's. Cultural probes, Gaver writes, form 'a design-led approach to understanding users that stress empathy and engagement.'[2] They can be objects, games or procedures that may seem estranging at first, but exactly because of this, they help to tease out responses. The goal is not so much to design solutions for current user needs, but to bring about new perspectives on the use of technology; it's functionality, aesthetics and politics. In other words, the designer is a provocateur who invites participants to start imagining futures and their implications they hadn't considered yet.

In addition we found inspiration in the notion of 'critical making', introduced by Matt Ratto in 2011. Ratto has argued for 'making' as both a pedagogical and research method to come to an understanding of processes and structures inherent in technologies.[3] The hackable city team believed that game making is an especially promising field when considering this approach. When people are invited to help design a game (rather than play one), they must reflect on the underlying structures and procedures of the given situation they want to turn into a game. As Schouten and his colleagues have put it:

'In the process of making a game, those rules tentatively model the general theoretical understanding of a given issue (e.g., urban empowerment) and connect it to a concrete representation (e.g., what takes place in the game). Complementarily, during play, involved stakeholders may consider the concrete elements symbolized in the game and, through strategic trial and error, explore what the game rules allow, what they forbid, which are the winning strategies (if any), thus forming a clearer mental image of the general theory behind the game.' [4]

From this perspective, the designers and researchers in our project have created three different games, or playful settings, in which particular aspects of the hackable citymaking were translated into specific sets of rules. In turn, these games were introduced as 'probes' to stakeholders in Buiksloterham, and the feedback we received from them was used in the re-design of some of these games. This way, these game-probes operated on three levels. First, they provoked stakeholders in Buiksloterham to discuss their practices of collaborative citymaking. Second, they forced the researchers to reflect on the underlying structures and principles of hackable citymaking that they formalized into game rules. Thirdly, the games themselves can be understood as prototypes for tools that could also be used in processes of collaborative citymaking elsewhere.

Our designs for The Water Game, Walking on Sunshine, and Play the City Buiksloterham were based on these principles. These games provided us with insight into how stakeholders were, or were not, collaborating towards common goals, what kind of recognition they sought, how they interacted within government frameworks, and what attitudes (in general) they held towards collaborative/collective citymaking.

Two other probes were developed to explore parameters for concrete tools to be used in a hackable citymaking process. The International Building Exhibit Buiksloterham derived from a research question about the organization of knowledge exchanges in open innovation systems. The Metrics & Indicators for Collaborative Building Groups explored a set of indicators that could be used to weigh collective and public interests in bottom-up area development.

Together, these research methods, and the probes resulting from them, forced us to continually iterate between an ideal model of the hackable city, and the concrete tools, games or probes that helped both us, and local stakeholders imagine it concretely. Step by step, we developed our model, while at the same time continually refining the methods and tools we were designing in the process.

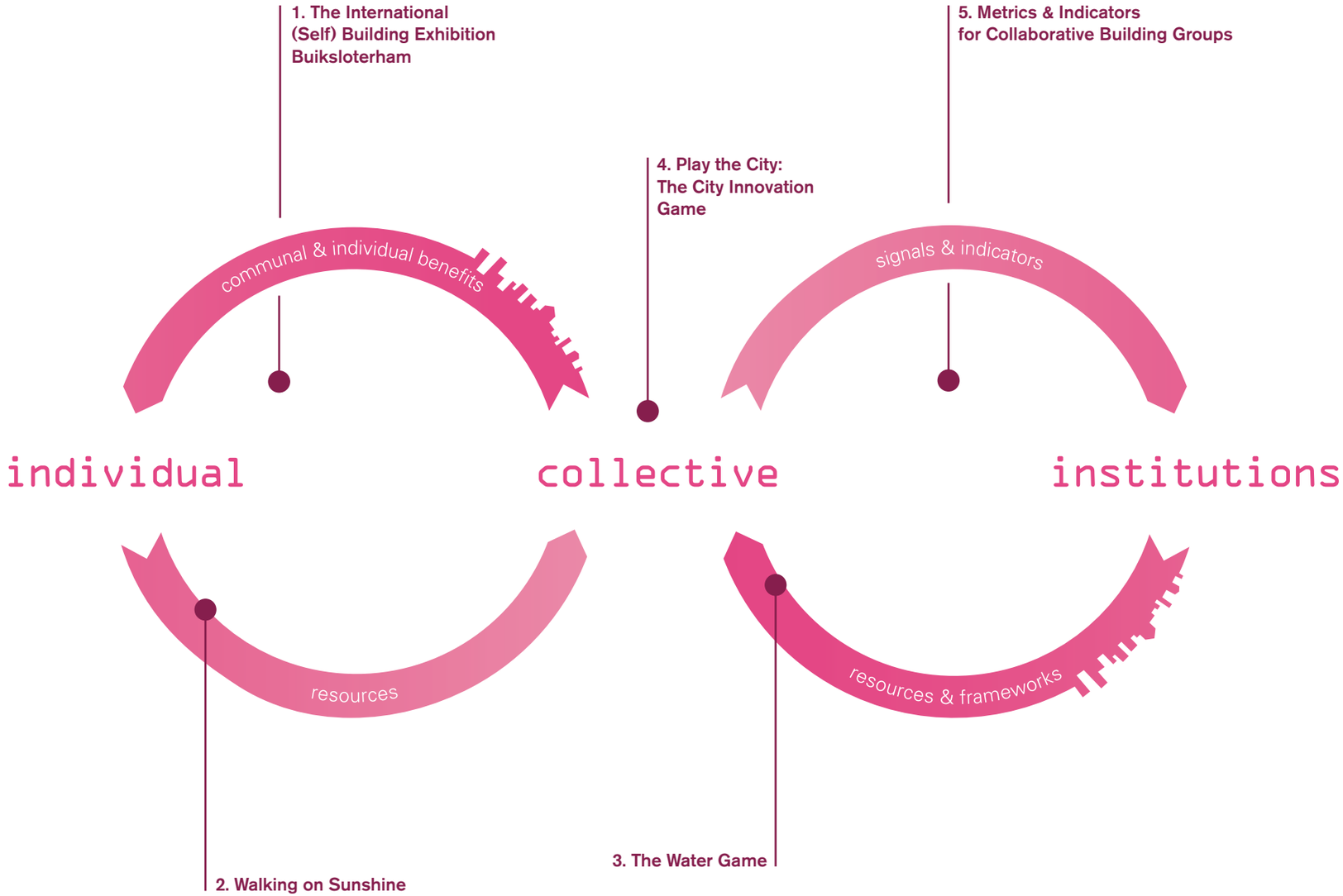
This cahier contains more detailed descriptions of our design probes, and the insights we gained from them. Given the limited time and scope of this research project, we ask you to understand them foremost as explorations that outline the contours for a hackable city. We find these contours promising, and urgent enough to develop further. We happily share our findings with you here, for further discussion, and perhaps further collaborative development in the future.

[1] John Zimmerman, Jodi Forlizzi and Shelley Evenson, 'Research through Design as a Method for Interaction Design Research in HCI', *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems - CHI '07*, 2007, 493-502 <http://dx.doi.

[2] Bill Gaver, Tony Dunne and Elena Pacenti, 'Cultural Probes', *Interactions*, 1999, 21-29; William Gaver, Paul Eluard and Benjamin Péret, 'Cultural Probes and the Value of Uncertainty', *Interactions*, 2004, 53-56.

[3] Matt Ratto, 'Critical Making : Conceptual and Material Studies in Technology and Social Life', *The Information Society: An International Journal*, 27.4 (2011), 252-60 <http://dx.doi.org/10.1080/01972243.2011.583819>.

[4] Ben Schouten and others, 'Games as Strong Concepts for City-Making', in *Playable Cities*, ed. by Anton Nijholt, Gaming Media and Social Effects (Singapore: Springer Nature, 2017) <http://dx.doi.org/10.1007/978-981-10-1962-3>.



1. The International (Self) Building Exhibition Buiksloterham:
How can communities of practice such as 'self-builders' learn from each other?
How can innovative approaches for building houses, that potentially benefit the public good, gain traction within and between communities of self-builders?

2. Walking on Sunshine:
How, and to what extent, can people be motivated to contribute their resources towards the creation of infrastructure as a 'commons'? And how, and to what extent, would they like to be rewarded?

3. The Water Game:
How can games help people to engage with water, as a common pool resource, in the process of area development?

4. Play the City:
The City Innovation Game:
To what extent could the use of 'city games' bring various stakeholders together, and help them build a collective agenda and action perspective for a specific area?

5. Metrics & Indicators for Collaborative Building Groups:
How can we evaluate the results of alternative models for area development, like collaborative building groups? How can their contributions to public value creation be institutionalized in new area development tenders?

Setting up a knowledge platform for self-builders

The International (Self)Building Exhibition

How can communities of practice such as ‘self-builders’ (people who build their own homes) learn from each other? And how can innovative approaches for building houses that potentially benefit the public good (like more sustainable ways to manage energy or water, or innovative uses for sustainable building materials) gain traction within and between communities of self-builders? These were the central questions addressed in a research track focused on knowledge sharing in the self-builders community, in Buiksloterham.

Peer-learning in a hackable city
The case of the self-builders

The issue of peer-based learning was deemed important for three reasons. First, from the perspective of the hackable city, peer-learning processes, and the collaborative production and curation of expertise are a central theme. Most hacker cultures are known for their iterative learning-by-doing approach; in which participants learn from each other by studying each other’s source codes, or through meet-ups, and other modes of exchange. Likewise, in a hackable city, it is key that innovative approaches for citymaking can be shared, and participants can either acquire the capacities needed for their involvement in citymaking processes, or can access (professional) expertise. Visions of ‘the city as platform’, such as expressed by John Seely Brown, explicitly refer to the affordance of cities as learning platforms.[1] Other research groups have put the notion of ‘public learning’ on the table, as an essential component of a democratic network society.[2] What are the formats and structures citizens and professionals can use to learn from each other, and construct collective bodies of knowledge?

Second, the issue of knowledge platforms and peer-learning was all the more interesting in the context of Buiksloterham. It had attracted an active community of self-builders who have experimented with numerous technological and cultural innovations while constructing their own homes. How could these innovative approaches for building houses, that potentially benefit the public good (like more sustainable ways to manage energy or water, or innovative uses of sustainable building materials), gain traction within and between (future) communities of self-builders?

Third, self-building is a relatively new process in the Netherlands. Local government institutions that set up these projects, and the legal and financial frameworks that surround them, could benefit from insights gained in earlier allocation rounds of building lots.

Peer-learning amongst self-builders in Buiksloterham

Self builders in Buiksloterham are currently sharing information and knowledge through a broad range of platforms like Facebook, Whatsapp, Basecamp, Yammer, email-groups, various websites, face-to-face conversations, and public or closed meet-ups. Many use Youtube-instruction videos to figure out particular technological challenges.

Most collaborative learning takes place on an impromptu basis, and on site. Information is mainly shared physically on location, when neighbors come over to give a hand, and explain and share practical information with each other. Information exchange usually takes place on a hyperlocal level: within a single site self-builders have found a variety of ways to collect and exchange information on the go, but there is not much exchange between various ‘generations’ of self-builders communities, and if so, mostly it is informal.

This makes it rather difficult for new generations of self-builders to find existing information, and build upon this knowledge. Moreover, similar to open software development, individual experiments and innovations are often not properly documented and non-transferrable. That partly explains why we found that in Buiksloterham many self-builders face steep learning curves, and are continuously ‘re-inventing the wheel’. Lessons learned about innovative approaches do not always reach their potential audiences.

Opportunities for sharing and learning

Despite the lack of a dedicated structural knowledge platform for self-builders, the ones we interviewed in Buiksloterham did show an interest in sharing information with new generations of self-builders. For some of them, boosting the visibility of their practice is an incentive for sharing their information. For others, this feeling originates from a 'hackers mentality, wanting to learn from each other and pass on knowledge. People we interviewed have different ideas, and thresholds, in relation to sharing. Some self-builders are open to sharing their acquired knowledge freely, whereas for others it has become a source of income.

In general, self-builders were keener to share if they could earn some money, or acquire a form of status. A few self-builders in Buiksloterham are known for sharing their knowledge and resources. One has set up a website where he consults self-builders for a fee. Another is known for sharing knowledge related to the development of the larger neighborhood. Yet another self-builder is known for supporting neighboring self-builders in times of 'crisis'. He has a good network of handymen, who can finish the house against relatively low prices. He mediates and provides work for his network of handymen. Often, people from outside the area come to have a look, bringing extra attention to the neighborhood.

At the same time, most self-builders reported that for them it's not feasible to actively contribute to knowledge platforms, share information, and write documents – due to time constraints. This means, that whereas most have shown a willingness to share, for most this remains limited to informal encounters and exchanges. A more structured knowledge network is not very likely to appear organically. This means that first and fomost a value model for such a platform needs to be explored further.

Value models for a knowledge sharing platform

As the spontaneous emergence of knowledge platforms is unlikely, due to lack of time and intrinsic rewards for self-builders, we've discussed various more formal models for the organization of such a platform.

Commercial publisher	A commercial publisher could organize the production and distribution of knowledge, making it available as a paid information source.	Financial reward could motivate actors to make their knowledge available. Business model is unproven yet. Who would be willing to pay for this information? And who should be rewarded for their contributions? It could also limit the availability of information to new audiences, as fees may prove to be a threshold for self-builders.
Open Source	A wiki or blog style knowledge platform run by volunteers, to which self-builders can contribute, e.g. by making available their blueprints or other 'lessons learned'.	Many self-builders are very much willing to share information, yet as self-building itself already demands a lot of energy, most of them do not have the time, or motivation, to document their process. Rewards here are mostly immaterial. Contributions could result in acquiring status: pride, recognition, and media attention for building an exceptional house.
Community run 'Freemium' model	A mix between the commercial and open source formats. Participants could set their own threshold with regard to the availability of information. For instance, they can offer consulting services or blueprints based on a fee.	Financial reward can be a motivation to share information. This is especially of interest to professional self-builders, who offer specific self-building related services, but less so for self-builders with no professional ties to building and development. Another issue to solve is who curates the platform as a whole. Which party would build and operate such a platform, against what kind of reward?
Public Curator	In this model, public institutions such as libraries, universities, broadcasting organizations and local governments would see it as their role to assemble peer-produced insights and knowledge, and make it publicly available in an accessible and attractive format. This could be designed in house, or in the form of a commission to independent publishers or professionals.	Institutional support ensures that knowledge would be archived. Institutions would have to assume new roles that are slightly different from their existing ones. For instance, libraries do not have much experience with producing information themselves, whereas university research is usually organized through 1-4 year externally funded projects that aim to produce scientific knowledge and theories for the academic community.
Building-Envelope	Sharing information could be encouraged through the creation of a 'bonus program' in the building envelope. E.g. in the procurement procedure, 'points' counting toward the overall evaluation could be administered for making information available. Alternatively, particular fees could be waived, or extra options (e.g. extra building volume) can be earned in exchange for contributing to knowledge platforms.	Again, such a reward scheme could encourage actors to make information available. At the same time, from a governance perspective this would be hard to enforce. How can contributions to a knowledge platform be assessed? To what standards of quality should it attain, and how could this be enforced?

The International Building Exhibition App

The International Building Exhibition App is a probe that explored designing a peer-learning knowledge platform for self-builders. It is modeled on the idea of the German initiative of the Internationale Bauausstellung (International Architecture Exhibition), an on-site exhibition of novel approaches to building, displaying new social, cultural or ecological principles for architecture and urban planning.[3]

The probe consists of a location-based smart phone app that could provide in depth information about self-built houses in Buiksloterham. While walking through the neighborhood, participants could explore the houses developed by self-builders (inside and out). Location based technology would prompt an information layer detailing the innovative approaches of these houses in the app, with references to online resources that would aid prospective self-builders in exploring opportunities to incorporate these innovations in their own projects.

We found this an appropriate approach, as the first generations of self-builders in Buiksloterham are special; many of them are architects or designers who have used the self-building plots to experiment and innovate. This resulted in a very diverse mix of houses. Each has it's own building style, and many are based on technologically, culturally or economically innovative ideas.

For instance, many builders experimented with using sustainable materials, techniques and designs. Others have innovated financially, or on a social-cultural level. For instance, by designing their house to fit the specific needs of their family's cultural or religious background, styles not typically found in traditional builds in The Netherlands. Moreover, they also set up local businesses, such as renting flexible workplaces, and managing local food cooperatives. The community also consists of citizens who have actively helped develop and design public space. So far, in close cooperation with the municipality, they collaboratively designed a park, and designed a system to stem traffic flow on a residential street in the neighborhood.

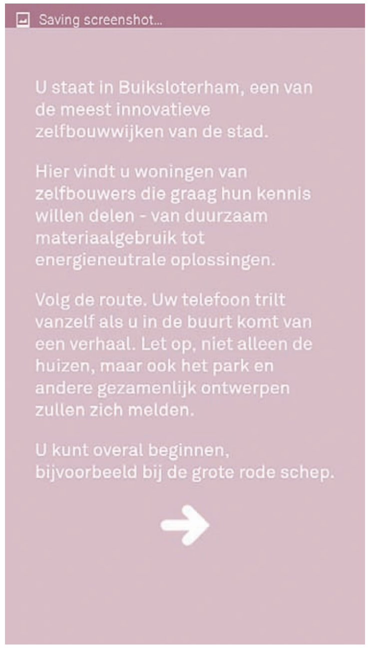
In order to make these innovations accessible, we came up with the idea to incorporate a knowledge library into a mobile application, that when triggered by strategically placed ibeacons, revealed an extra layer of information about the houses and objects in the area. By letting the houses themselves 'talk' to potential self-builders, we aimed to connect the tactile experience of being on location, with an extra layer of information explaining, in depth, aspects like design, material choice, suppliers, and innovative building approaches. Incorporated in the app are also videos shot from inside the houses, that make the normally invisible, visible. Contributing self-builders were able to grant visitors access to their homes, without actually being there.

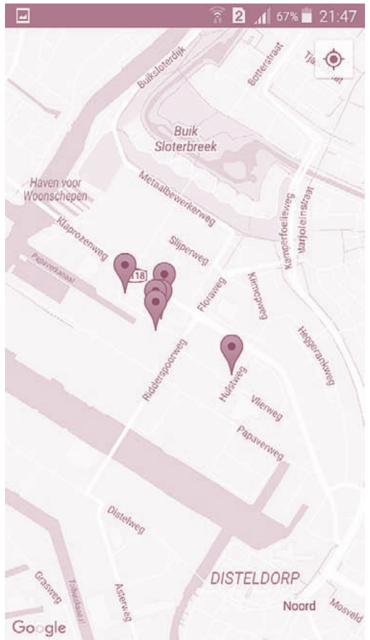
The app was organized according to the 'public curation' model, in which the researchers took on the role of curator, interviewing self-builders and documenting their buildings and approaches. The app was a probe to provoke further discussion about the set-up and design of a knowledge-platform for self-building, as well as examine and compare the amount of knowledge, or 'threshold', each self-builder was willing to contribute, and what kind of reward they expected.

A small group of future and current resident self-builders tested the prototype app during a workshop. This resulted in the discussion of a number of design-parameters.

Design-dilemma:	Description:	Evaluation:
Anytime, Anywere, Anything -vs- Event based	The app could be used at any time of the day, and it wasn't compulsory to be at the specific location of the house to access the information provided. Yet, the app was tested in an 'event' like setting, at a specific time and location, during which self-builders were also invited to open-up their houses for visitors.	Participants were very enthusiastic about the app functioning on location, that way self-building processes become transparent. They appreciated that some opened their house to have a 'look behind the scenes'. The organization of a location and time specific event around the distribution of information was experienced extremely positively.
Content organization: generic categories -vs- individual stories	In the first iteration of the app, information about each house was assembled in 6 categories, representing various aspects of self-building, like technology ('How did I build this house'), finance ('How did I pay for it'), and lessons learned ('Don't do this again'). In the second iteration, each house was categorized for a particular way in which it was innovative, and an attempt was made to detail the builder's specific approach; by including personal stories, in combination with practical information and references to more in depth information and practicalities.	The individual story approach was more interesting and manageable for the curators and participants than the generic-category approach. It proved hard to fill out all the categories for each of the houses, whereas the element that made those houses specifically unique was easily overlooked. Participants were enthusiastic about the foregrounding of the different approaches to self-building. They also appreciated the combination of personal stories with practical details. A future self-builder was especially pleased to get a better grip on the costs involved in building your own house. She was also enthusiastic about the deep links, giving access to practical information, such as reliable contractors.

Design-dilemma:	Description:	Evaluation:
Centrally controlled curation -vs- platform function	The app can be designed as a platform, where willing self-builders can easily add and edit their own information; or it can be run by an editorial team that gathers and edits information from self-builders.	Current self-builders in Buiksloterham had mixed reactions about how they would like to share their information through the app. Some would like to control, add, create and share content themselves – whereas others have made it clear that they have limited time, and prefer to be interviewed. One option would be to opt for a hybrid model, in which an editorial team assembles information, then gives self-builders editing rights to add or update information.
Free, Paid or Freemium	Three business models were discussed. In the first, information would be assembled by a public institution and made available free of charge. In the second, participants would pay to download the app, or for specific layers of information. In the third model, the information in the app would be feely available, and current self-builders could offer consulting services to future self-builders who would want to learn more, or get access to more practical details.	Participants reported mixed feelings as to whether they were willing to pay for the content. Most people were willing to pay some fee to download the app, if the content is relevant. Some are not sure. In-app payments, such as paying self-builders consultancy fees for sharing information have a high threshold. Most self-builders doubt whether they would pay a consultancy fee to current self-builders. Some current self-builders were interested in advertising their business through the app.


Saving screenshot...
U staat in Buiksloterham, een van de meest innovatieve zelfbouwwijken van de stad.
Hier vindt u woningen van zelfbouwers die graag hun kennis willen delen - van duurzaam materiaalgebruik tot energieneutrale oplossingen.
Volg de route. Uw telefoon trilt vanzelf als u in de buurt komt van een verhaal. Let op, niet alleen de huizen, maar ook het park en andere gezamenlijk ontwerpen zullen zich melden.
U kunt overal beginnen, bijvoorbeeld bij de grote rode schep.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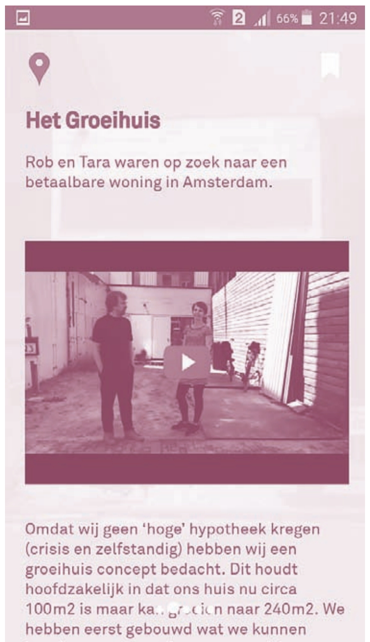
Het Groei Huis
Monnikskapstraat 22


66% 21:49
Het Groeihuis
Rob en Tara waren op zoek naar een betaalbare woning in Amsterdam.
Omdat wij geen 'hoge' hypotheek kregen (crisis en zelfstandig) hebben wij een groeihuis concept bedacht. Dit houdt hoofdzakelijk in dat ons huis nu circa 100m2 is maar kan groeien naar 240m2. We hebben eerst gebouwd wat we kunnen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Toekomstbestendig maken
Omdat het huis veel in waarde is gestegen, door de populariteit van de locatie en de schaarste op de huizenmarkt is het mogelijk om het tweede deel van het huis te gaan bouwen. Het idee is om om een deel van de aanbouw te gaan verhuren.


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Hoe nu verder?
Een huis is een expressie van de mensen die er in leven. Het principe van groei en bouwen met wat je financieel kan dragen raden wij iedereen aan. Mijn bedrijf Timebased voor architectuur en interieur werkt met deze principes.
Voor meer informatie kunt u contact opnemen via:
Timebased
06 43989389

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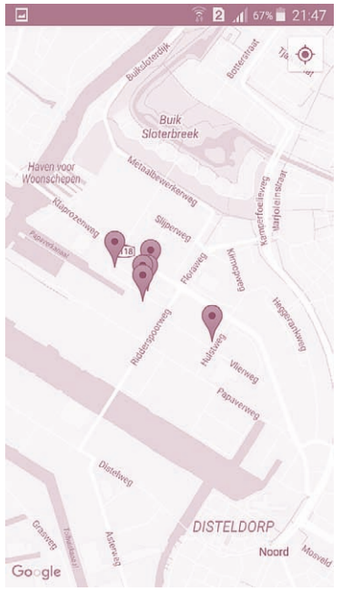
U staat in Buiksloterham, een van de meest innovatieve zelfbouwwijken van de stad.

Hier vindt u woningen van zelfbouwers die graag hun kennis willen delen - van duurzaam materiaalgebruik tot energieneutrale oplossingen.

Volg de route. Uw telefoon trilt vanzelf als u in de buurt komt van een verhaal. Let op, niet alleen de huizen, maar ook het park en andere gezamenlijk ontwerpen zullen zich melden.

U kunt overal beginnen, bijvoorbeeld bij de grote rode schep.



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De Wintertuin

Het broeikaseffect is een van de oudste en bekendste fenomenen in de klimaatdiscussie. Kortgolvige lichtstraling passeert het glas en wordt omgezet in langgolvige warmtestraling die minder goed terug door het glas weer naar buiten kan. De achterliggende ruimte warmt daardoor op.

Sinds de vorige eeuw zijn deze principes langzamerhand tot de woningbouw doorgedrongen – gestimuleerd door de kolenschaarste na de Eerste Wereld oorlog en de oliecrisis. Kaswoningen bestaan al sinds de jaren '50.
Download PDF hier

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De beste installatie is geen installatie

Een woning zonder omhullende kas heeft 50% meer energie nodig dan een woning met kas. Dit komt doordat het huis omringd word door een luchtbuffer die circa vijf graden warmer is dan omgevingstemperatuur, waardoor de transmissieverliezen lager zijn. Klaus Becher maak hier, in zijn Bio-Solar catalogus huizen, bewust gebruik van, zodat de woningen vervolgens installatie-arm te bouwen zijn. Installaties gaan altijd kapot. De beste installatie is geen installatie.

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Doorontwikkeling van de kaswoning

Bij Kasco, een doorontwikkeling van de kaswoning naar een cataloguswoning, wordt het principe van scheiding drager (de permanente constructie), schil (de gevel en ramen) en inbouw (de binnenwanden) doorgevoerd om de weg vrij te maken naar een grotere mate van zelfbouw.

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Conclusion

Knowledge platforms play a key role in hackable cities. They allow citizens to learn from each other, and encourage innovations to spread. Individual citizens contribute their knowledge to them, whereas other groups can benefit. However, these knowledge platforms take effort to organize on a collective level, especially in the case of self-building: the process of contributing and profiting from collective learning takes place a-synchronically, with a high information-need at the start of the process, combined with a lack of time for documentation during the process.

We have argued that the provision of a knowledge platform around self-building could be beneficial to society. It can stimulate peer-learning around innovative building approaches, leading to high quality, more efficient houses and public spaces, and make these innovations available for a larger audience. At the same time, it also allows local governments to learn from their residents, and their experiments.

Self-builders are willing to share and contribute, but lack the time or motivation to do so in a structural way. Informal learning mostly takes place within self-building communities, but for new generations of self-builders it can be difficult to get access to specific information and knowledge. A successful knowledge platform around self-building would require some form of organization on a collective level, as well as a business model to support it. A public curation model in combination with a 'freemium model' in which current self builders can offer their consulting services to a next generation could be a promising approach. As the results of such a platform could contribute to both private and public values, the set-up would warrant the investment of public resources, or the active involvement of public institutions.

[1] David Bollier, *The City as Platform : Urban Life and Governance* (Washington, D.C.: The Aspen Institute, 2016).
[2] Platform Connected Learning, *Publiek Leren* (Den Haag: Haagse Hogesschool).
[3] It is particularly inspired by the Welcome in My Backyard-project undertaken by Crimson Architectural Historians in the Dutch new town of Hoogvliet, which took the format of international building exhibition as a site specific model to explore development models for new towns that are based on 'an urban ethics in which changes and additions are seen as a potential source of enrichment for residents' https://www.crimsonweb.org/spip.php?article27; See also Felix Rottenberg and others, *Wimby! : Hoogvliet : toekomst, verleden en heden van een New Town, of: Het grote Wimby boek* (Rotterdam : NAi Uitgevers).

The Water Game

Collaborative game making for the urban commons

How can games help people to engage with water as a common pool resource, during the process of area development? In this contribution, we'll discuss a series of game experiments about water. Our aim is to explore, evaluate and reflect on the potential of games to engage people, in this case, with urban water resilience, a fairly abstract theme. During the development of the water game, we wanted residents who are living or working in Buiksloterham, or planning to do so, to contribute their ideas through action. How can this approach help define new collective values about water? What new insights arise in relation to the overarching question: how can digital media be used to make cities hackable, and leverage the 'smartness' of citizens, in order to address complex issues facing cities today?

Water as a collective resource

We chose the theme water because several partners in Buiksloterham were dealing with this issue in relation to developing the 'circular city' (closed loop sustainability). Our key partner, One Architecture, specializes in creating water resilient cities, for instance with projects in New York City, and Amsterdam. We also partnered with Amsterdam Rainproof, an innovative project initiated by public utility company Waternet. Amsterdam Rainproof aims to make the city more robust in their ability to cope with increasingly heavy rainfall.

During a series of game sessions with these partners, we defined the main issues, and mapped stakeholders. Based on initial feedback, we concluded that water resilience is indeed a slippery topic. For whom is water a relevant problem? Why not just let government ensure safety? – after all, it's their job. On what levels does this problem exist: is it an individual issue (avoiding your house being flooded) and/or a collective question – and if so, on what scale? There is also a temporal dimension: How can you make people engage now, with an abstract future scenario? Practically, how do you synchronize individual projects on a collective level, for example installing water storage tanks together, to communally store rainwater as a collective resource? Because of these questions of engagement and agency, we decided to develop a game that allowed us to investigate future scenarios about water. With game designer Karel Millenaar, Froukje van der Klundert and Michiel de Lange worked on a series of game iterations that allowed people to play with various options for managing water. A snapshot version of one of these iterations, *The Neighborhood*, is included as part of this publication.

The Neighborhood started out as a cartography based, storytelling and role-playing game – inspired by the design of A Quiet Year. Using a rough map of a fictional neighborhood, players draw sketches in order to tell stories about how their neighborhood changes and develops, based on event card prompts. Players develop some basic qualities of their personas, and their households (e.g. age, job, family, preferences, hobbies). In the process, they express personal values connected to their neighborhood. Players connect concrete things, like green spaces, play spaces for children, a water tank, or a rainwater-based microbrewery, to more abstract values; like a sense of community, and willingness to share infrastructure and knowledge.

Fine-tuning this approach further, we decided to provide players with a more narrative structure, by providing initial scenarios, and a sequence of scenes. For instance, in the case of a water catastrophe, players were asked to state how this immediately affected their neighborhood, and how they thought about solving this individually, collectively, and in the long run. We found that this worked well as a narrative-driven brainstorming tool. We then reinserted some typical game elements, like event cards and chance cards, in new play tests. This is the version of the game included in this publication.

Play testing consisted of multiple rounds of closed and public sessions. These took place at One Architecture, urban innovation lab FabCity (Amsterdam), the City Makers Summit in Pakhuis De Zwijger, and at the International Architecture Biennale, in Rotterdam. We felt the game should not necessarily provide solutions, but raise questions and test hypotheses about hackable citymaking. We considered the game a tool to brainstorm 'what if' scenarios that envision water as a collective good, for which various stakeholders assume specific responsibilities. Hence, we shifted our focus from water as a problem (too much rainfall, or too little clean water) to water as a 'common pool resource': a collective good with shared ownership, which is (often) governed by a self-organized community, to prevent overuse or misuse. Driven by the game mechanics and dynamics, participants brainstormed about ways to share water. The game was also a tool to develop and articulate shared values about topics like nature, sustainable living, community building, and culture.

Strong concepts in game design

The Water Game acted as a catalyst for generating a set of strong concepts. These are notions that allow research questions to be translated into a design strategy. Strong concepts are generative ideas that exist both in the domain of citymaking, as well as game making; and therefore help to make complex systems more tractable. The strong concepts we identify are *refereed arguments*, *shared narratives*, and *duality of resources*.[1]

Strong Concept	***Refereed argument***	***Shared narrative***	***Duality of resources***
Description of concept	*Refereed arguments* connect in-game mechanics that ask players to make persuasive arguments about the outcomes of their actions to real-world negotiations, that happen in informal groups of citizens who are involved in the process of city-making.	*Shared narratives* bridge players' collaborative storytelling during the game to the more social process of building local identities within their neighborhood.	*Duality of resources* points to the ambiguity of playable elements as having both positive and negative potentialities for citymaking. Water can be both a threat and an opportunity, for developing city infrastructure, social dynamics, and urban culture.
Operationalization in game mechanics	Early versions of the game were strongly refereed by the game master. In later versions, scenarios directed players. For example, your neighborhood has flooded, how will you react, how will you help your neighbors, and how will you prevent this from happening in the future? This triggered players to come up with convincing arguments.	The game did not attempt to spur competition, except in a friendly way. Instead, it rewarded collaboration, since shared storytelling made the sessions more interesting, and satisfyingly complex. Drawing together on a map created a visual sense of collectivity, and was a shared space that allowed players to develop imaginative narratives.	The game allowed people to play with ambivalence. Players were challenged to reframe water – from threat to opportunity – and therefore understand the complexity of water-related issues, and urban resilience.

Conclusion

One key question is how in-game action connects to the 'real world'. Applied games are frequently viewed as a 'jack-of-all-trades'. Games can be instructive and teach players how to achieve specific goals. They also encourage players to critically unpack existing systems, in what is termed *procedurality* (what hidden logic and power drive the system?), stir the imagination (could it be different?), and allow players to experiment with alternative actions (how to do it differently?). Games help to forge and build trust between stakeholders. In our case, we turned to game making as a research tool to help identify urban problems, and discuss these with stakeholders. During this process, both the making, and the playing, mattered. We connected a thing (the game), a situation (the setting), a group of people (stakeholders), and an issue (water as a collective good in a specific neighborhood) to larger theoretical arguments about empowerment and ownership. The strong concepts discussed above connected the worlds of game making and citymaking, and helped imagine Buiksloterham as a hackable city, open for systemic change from within.

Another key question about applied games is whether, and how they scale. Can you simply apply this tool to a similar situation? The answer, predictably, is: it depends. We believe that the theme 'water' can easily be replaced by another ambivalent or controversial shared resource, or issue. However, the game mechanics we developed include built-in rhetoric about the participatory and democratic processes of hackable citymaking, which is difficult to relinquish. Furthermore, we worked within the specific context of the Buiksloterham in a specific moment in time. This context was very conducive to experimentation and innovation, but in other situations this might be different. Nevertheless, we believe that working with games has great potential, because gaming has become part and parcel of people's cultural repertoire. It's no longer unusual to find games in boardrooms to aid decision-making. In our view, hackable citymaking means making cities playable.

[1] For a more detailed description of the game variants, see Ben Schouten and others, 'Games as Strong Concepts for City-Making', in Playable Cities, ed. by Anton Nijholt, Gaming Media and Social Effects (Singapore: Springer Nature, 2017) <http://dx.doi.org/10.1007/978-981-10-1962-3>.

Walking on Sunshine

Could residents in Buiksloterham imagine designing and managing public infrastructure collaboratively as a 'commons'? How, and to what extent, can people be motivated to contribute their resources; and how would they like to be rewarded? These questions were investigated in the research workshop, Walking on Sunshine.

Collaboratively making a sidewalk

This research aimed to investigate and illustrate emerging dynamics between neighbors, as they attempted to collaboratively design public infrastructure – following the model of the 'commons'. To make this abstract theme more concrete, residents were invited to a workshop to design a hi-tech sidewalk together. The 'circular' sidewalk tiles were produced from their own green garbage.

The management of a collective infrastructure based on the circular economy can be understood as a typical 'commons' problem. Individual contributions are weighed against collective profit – although the pay-off is non-exclusive – citizens who haven't invested their own resources also profit from these contributions. In other words, infrastructure can be understood as a public good. Here, we explain how by introducing a few incentives citizens can take ownership of it.

One hypothesis is that datafication could incentivize citizens to take ownership of the construction and management of public infrastructure. Datafication allows for mapping both individual contributions and communal gains. Based on this information, individuals could be rewarded, or charged, according to their individual usage, and/or contribution.

The idea for the sidewalk was inspired by the emergence of new technologies. Foremost, innovative techniques that make it possible to transform 'green waste' into a sustainable building material. Green waste can be superheated via a process called pyrolysis, producing a substance called biochar, which in turn can be stabilized in cement. The result is two-fold: biochar stores carbon: one kilo of biochar equals three kilos of trapped atmospheric CO2. Additionally, other components in the cement continually filter and neutralize emissions. Energy produced during superheating can also eventually be transformed into gas, and then heating or electricity.

Contributions toward the creation of this resource can also be measured, for instance through the introduction of chipped 'smart' bins that digitally weigh and transmit the volume/value of each resident's garbage. Could the neighborhood combine both technologies to pool their garbage, and thus collaboratively produce a piece of sustainable concrete infrastructure that could improve the environment?

To explore this question, we asked participants to create a sidewalk together during the workshop. Each resident was dealt a number of sidewalk 'tiles', and asked to respond to specific questions by physically positioning his or her individual tiles. This made it possible to see immediately how individual choices affected the group. While residents answered a series of questions about donation, collection, rewards and profit sharing, and personalization – the sidewalk morphed and evolved – reflecting their real-time decisions.

Built into the workshop were a number of rewards, both material and immaterial. Visualizing these rewards allowed participants to immediately reflect upon the implications of their choices. Throughout the workshop, the sidewalk was a concrete reference point, giving tangible form to discussions about collective organization, in relation to the development of public infrastructure. The workshop proposed four challenges, each one aiming to tease out discussions around a specific theme.

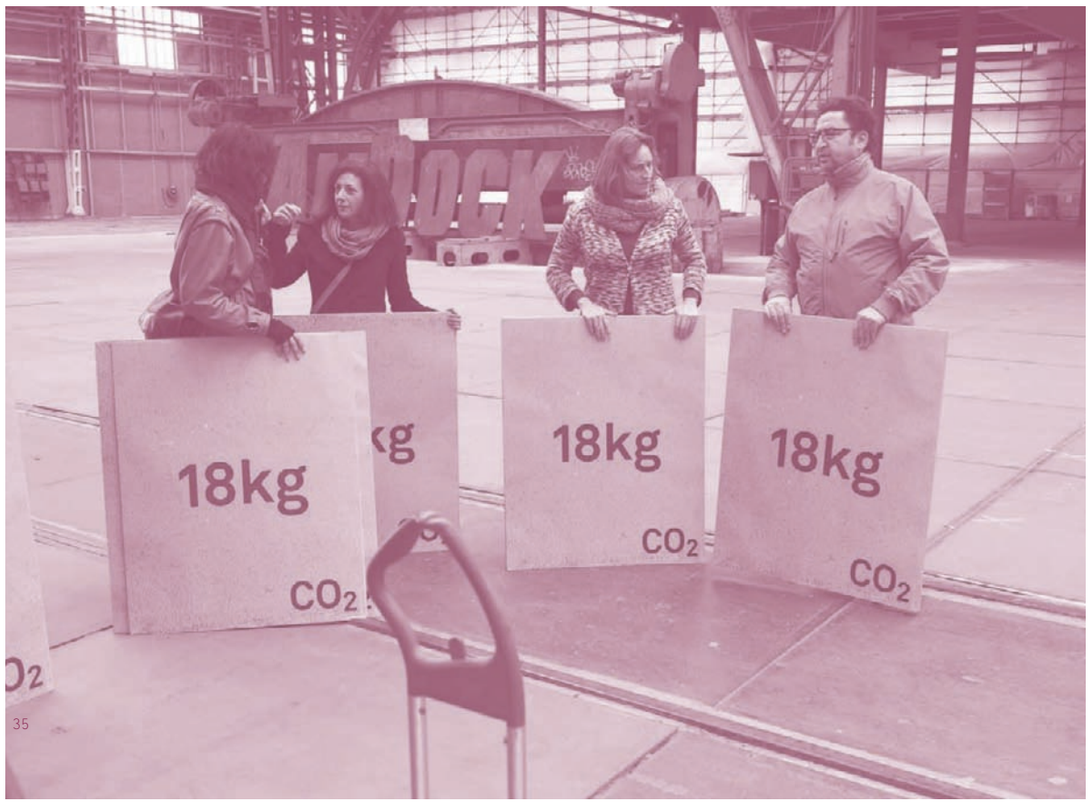
1. Pooling resources – who, and how

Question: Are residents willing to pool their individual resources (e.g. green garbage) toward a 'public good'? (In this case, achieving their goal of living in a circular neighborhood.) How should these contributions be governed?

Challenge: At the start of the workshop each resident was assigned a specific number of sidewalk tiles, representing the make-up of their household. One concrete tile (80cm x 100cm) equals the average yearly output of green garbage per individual – 100 kilo. Thus, a person with a two person household received two tiles, a person with a four person household received four tiles, and so on. Additionally, residents who volunteer to maintain the local park each received a green 'park tile' (made from the green clippings from the park). We asked each resident how much he or she would donate toward the creation of the sidewalk. One by one, they lined up their tiles on the floor, representing their contributions.

Discussion: All but one of the participants was willing to donate some, or all of their waste. Almost half of them decided to keep a portion of it for their own gardens. Two participants were willing to donate their tiles only if the sidewalk was managed collectively; otherwise they were not interested in participating at all. Following this 'only if' declaration, the group determined that decision making should be non-hierarchical. No one was in favor of residents who produced more tiles having a larger say in the outcome of the sidewalk, or the distribution of eventual rewards.

Although participants were in favor of mutually recognizing each other's contributions, they deemed recognizing them publicly, unnecessary (For instance, by engraving their name in the tiles). Recognizing individual contributions 'behind closed doors' did seem attractive to the group and was thought to stimulate potential participation, and group cohesion.



2. For what it's worth

Question: How do residents perceive the value of their raw materials, and what kind of rewards do they expect for contributing them? For instance, are they willing to donate their resources for free, when the municipality, or private collection companies are earning from their waste?

Challenge: The workshop continued with participants lining up their tiles on the ground to form the sidewalk. Each tile represented 18kg of stored carbon. Everyone calculated both their individual total, and the overall total of carbon the group trapped in the sidewalk. On the back of the each tile was printed 25 euro, a potential reward for reducing CO2 emissions, provided in this case by the municipality. Flipping the tiles to calculate both individual and collective rewards was the starting point for the following discussion.

Discussion: When we first asked if they would like to receive a monetary reward for donating their raw materials, or if contributing to the common good was reward enough, everyone quickly agreed that contributing to the common good was reward enough. However, when the group was informed that the municipality normally earns a profit from the waste they collect, the mood changed. Everyone decided that if the municipality offered a 'credit' for donating, they would accept it. (For instance, in the form of a tax exemption.) This turn of events signaled that a monetary reward could be an additional incentive toward contributing to the greater public interest. Residents felt that if the municipality was entitled to profit, they could profit as well.

3. Rewards: individual vs. collective

Question: Do residents prefer to be rewarded individually, or collectively? What kind of new social and economic co-operations emerge when residents decide to join together to implement their resources?

Challenge: The group had amassed a 425,00 euro investment, plus 306kilos of carbon storage, which they could decide to trade with on the carbon market. We asked participants if they would keep the money for themselves, or pool their profits. We also asked what type of collection plan they would prefer, with different modes of data collection calculating their individual and communal contributions:

– dumping green garbage at one central point in the neighborhood – that totals the weight of the neighborhood's deposit indiscriminately
– dumping green garbage at one central point in the neighborhood – that tracks the weight of each individual's deposits, and totals the neighborhood's deposit
– a per house bin that is collected and dumped at a central collection point, where the neighborhood's total deposit is calculated
– a per house chipped bin that tracks individual deposits, before it's collected and dumped at a central collection point, where the neighborhood's total deposit is calculated

Discussion: They responded unanimously that all profits should remain collective – and decisions about how to spend them should also be made collectively. Ideas ranged from investing in programs to achieve zero waste targets, to sharing knowledge in order to help put sustainability on the agenda in less affluent neighborhoods. Nobody took the money and ran – the entire group aimed to reinvest their profit on a yearly basis, preferably locally.

The question about modes of garbage collection further explored how residents wished to remain visible within the collective. Perhaps a central collection point could also stimulate donation, and cohesion? Interestingly, the group was split about a central collection point vs. individual bins. Everyone agreed that individual deposits and profits should be tracked – as long as these data and profits remained within, and the property of the group. The wish to be recognized individually runs parallel to their demand for transparent organization and governance.

4. Participatory design and governance

Question: Do residents feel that the role of producer also entitles them to determine the 'look' of the sidewalk? How does the collective govern content?

Challenge: The last phase of the workshop shifted to questions about aesthetics and recognition. Could choosing or personalizing your own tile(s) also be considered a kind of reward? Participants were given three design options:

– a ubiquitous tile: thus matching the rest of the group (in this case, a standard grey concrete tile)
– a 'social' tile: representing a cause they identify with: one tile was the 'lady bug tile', the national symbol for protesting against domestic violence. The other was the traditional 'knikkerput tile', for playing street marbles
– a personalized tile: for example the 'Hollywood Walk of Fame' tile. Everyone was handed a marker to write his or her name, or a personal message

Discussion: This set of options rocked the group dynamic. Their reactions were clearly inconsistent with each other, and impassioned: 'Nice if each tile tells a different story!' 'Just please, a simple grey tile, not that everybody is doing his own thing'. 'I'm not into an extravagant mosaic.' 'Let's choose one look together, perhaps from a pre-designed set of options.'

Things got especially out of hand when one resident drew an 'anti-sustainability' logo on his tile. He explained that even though he was in favor of recycling, building houses was his main focus; and that the neighborhood's highly sustainable principles had begun to irritate him. His personal views clashed with the rest of the group, which led to a heated discussion about how to make decisions about ownership vs. content.

The group agreed there should be some form of oversight to handle this issue, but what this should be remained unclear. Some were in favor of a democratic system – a majority vote resulting in the inclusion of visual content. One participant was in favor of a sociocracy. Others sought to avoid the discussion all together by outsourcing 'design' to a professional, or choosing from pre-fab design options, (a strategy already employed by the municipality). In contrast to harmonious discussions about non-hierarchical decision making and profit sharing – governing the 'look' of the sidewalk was clearly a challenge.

Conclusion

The management of the commons is a central theme in hackable cities. Under what conditions, and through what systems of self-governance can local communities produce and manage their own resources? 'Research through making' helped make the notion of the commons concrete, by visualizing a central theme in the management of the commons: individual vs. collective rewards.

Walking on Sunshine revealed that residents were willing to contribute their private resources to a common good. Participants decided that their individual contributions should be tracked – and that this data be available to the commons. This proposal seemed to both stimulate individual donation, and also provide a sense of recognition within the larger context. They maintained that varying degrees of contribution should not result in varying degrees of influence, in the overall decision making and governance structure. However, a shift occurred when 'personalization' was introduced. This form of visual ownership triggered an intense discussion about how to govern content. Managing the aesthetics of the sidewalk was truly a challenge for the group.

Smart city technologies make it possible to realize some of the group's ambitions – for instance tracking individual contributions at the 'back end'. More complicated issues, like determining new forms of governance to organize investment and content management, are challenging aspects of collective design that require further investigation.

Play the City: The City Innovation Game

Making a circular neighborhood like Buiksloterham is a complex process, in which many parties are involved. To what extent could using ‘city games’ bring various stakeholders together to help them build a collective agenda and action perspective? What particular mechanics, dynamics and aesthetics of the game could stimulate this interaction? In this research track, together with Play the City Foundation, we developed the City Innnovation Game Buiksloterham. The game was played a number of times, including one session with about 30 stakeholders in Buiksloterham; including self-builders, commercial property developers, energy corporations, and representatives of the municipality.

How to play the City Innovation Game Buiksloterham

The game board & game objects
The City Innovation Game consists of a large playing board (approximately 4 by 4 meters) mounted on a table, representing the area of Buiksloterham – on a 1:300 scale. The board is accompanied by a set of representative objects (e.g. houses, schools, restaurants, shops, greenhouses), as well as infrastructure and resources (e.g. roads, solar panels, windmills, waterways, farmland, orchards), and public amenities and cultural facilities (e.g. parks, theatres). These objects are part of a library, and can be acquired by players from the bank, and placed on the board.

Playing the Game
A game master orchestrates the game in a number of rounds. In each round, the game master announces the goal for that round. Players then take turns acquiring objects from the game library, and placing them on the board in order to achieve this goal. The game master invites players to explain their moves, following which discussions emerge with the other players/ stakeholders. The game master can also invite experts to comment on moves made by players. Is their action legal, technologically possible or financially sound? These experts can be other players, or non-playing observers. In between rounds, players are invited to wander around freely and discuss, negotiate or coordinate their resources and actions with other players.

Players
At the beginning of the game, players are given a parcel of land, a particular role (e.g. project developer, self-builder), and a goal and set of resources (e.g. a limited amount of money). Alternatively, players can also play themselves, departing from their own plot at the start of the game, and trying to actualize their real goals for the area.

End of the game
The game ends after a set number of rounds (determined at the beginning of the game). There is no way to 'win' the game. The most important outcomes are the discussions provoked by the players' actions, and the resulting social interactions between players.

Hacking the city by playing a game

The mechanics of the game helped to stimulate actors to collaborate and build and actualize their collective visions for the area in at least four different ways.

The game as a 'focal thing'

Firstly, the game board acted as a 'focal thing' for group conversations. This term is derived from technology philosopher Albert Borgmann, who considered the fireplace a social setting to convene around in the house, without necessarily having very intense face-to-face discussions with a lot of eye contact. In the game setting, the board functions in a similar way. This effect created a certain social distance that cultivates both a common understanding, as well as a social 'safety zone' for discussions: players are not criticizing each other personally, they are just commenting on the action on the board.

Forcing concrete actions

Secondly, the game board provides a shared view of Buiksloterham that is modeled on reality, albeit with some simplifications. The concrete nature of the model forces discussions to become concrete as well. It makes abstract themes like circularity, or innovative ideas, more tangible, by forcing players to point out specific locations. Where would you place an abstract issue like air quality, or social equality? How can you resolve conflicting ideas about urban futures on the game board?
Players also feel that they can indeed shape and make the future. Often, the sheer complexity of cities seems to stifle people from becoming true actors. Through deliberate simplification, games open up a horizon that connects understanding and action. Residents become active players with agency, instead of mere consumers, users or subjects: a game can help players to start to imagine their city as 'hackable'.

Collaboration & making urban design political

Thirdly, the gameplay invites stakeholders to collaborate by using the board as a co-creation tool that enables the enactment of new ideas. They collectively make the board 'theirs', by accomplishing goals together. Speaking and thinking out loud around the evolving game board creates an energetic feeling of 'we can make a change', and stimulates trying out ideas in a relatively 'safe' environment – after all, it's just a game.

This enables players to discuss the future of the city collectively. Games are a means toward making urban design 'political', because they can be about real visions and decision-making, rather than the mere technical matter of making optimal choices. A game like The City Innovation Game actually alerts residents to potential new interactions and relationships within their city, by playing. Shifting relationships between actors are part of the lived experience of the game. Especially in an urban setting, this seems particularly urgent. Moreover, the City Innovation Game Buiksloterham is a tool to explore the paths people need to walk to achieve their goals. Not only does the game ask 'what if', it is also asks 'how to'.

Sharing knowledge & community building

Finally, the game invites people to share actual knowledge, and discuss neighborhood issues, like who owns what plot, what is already there, and what is the most current state of affairs. Competing dialogues emerge about ambitions, plans and obstacles, in a playful mode. This can help to familiarize stakeholders with each other's agendas, and could strengthen the community by building a sense of trust. At the same time, this is not a given. The game can also tease out conflicts and tensions between actors, which cannot always be resoled through the game.

Outcomes of the City Innovation Game Buiksloterham

When played with actual stakeholders, Play the City Buiksloterham led to three different types of discussions: Agenda building (what do we want), Realization (how do we get there?) and Regulations (what kind of government frameworks do we need, and which ones stand in our way?)

Agenda building

There are many actors present in Buiksloterham, with varying interests. In 2015, a number of them took the initiative to draw up a manifesto to develop Buiksloterham according to the principles of the circular economy. Their commitment to this manifesto is continuously reinforced through network meetings in the area. Playing the City Innovation Game Buiksloterham was another opportunity for the community to convene, to reinforce the manifesto's principles, and further concretize some of the issues. For instance, they discussed a plan to construct a communal solar energy farm on the roof of a warehouse. Other parties introduced their ideas for a bio-refinery in the area, and how to get 1,200 households on board to make the investment worthwhile. No official plans were drawn up, yet the exchange of ideas did seem to confirm stakeholders' commitments to the original Circular Manifesto, and highlight and elaborate a number of aspects of it – while new stakeholders became familiar with it's inception.

Realization – How do we get there?

One result of the game was the exchange of knowledge. Stakeholders learned from each other about current developments, regulations, and the affordances of new technologies. Although this knowledge wasn't formalized, some participants reported that this aspect of the game was the most attractive, and useful for them. For instance, a substantial amount of knowledge and firsthand experience was exchanged about both the communal solar farm, and the bio-refinery.

Regulations & government frameworks

Many discussions during the game focused on the role of the government, and the frameworks it should (or should not) set to aid in the development of Buiksloterham, as a circular neighborhood. On the one hand, it was argued that if the city is serious about endorsing the circular economy, it should use legal frameworks to actualize it. For instance, by using building envelops – a set of rules and guidelines for the development of a lot – to force developers to build in a circular fashion. For the development of social housing projects, such regulation could even be required; currently social housing companies are not allowed to invest outside their core mission: the development of affordable houses. Exceptions cannot be made, even if it's a contribution to a public cause like the environment, or affordable energy, that would serve the socio-economic groups they work for.

On the other hand, many pointed out that strong frameworks might also hamper innovation, and do not leave enough room for out-of-the-box solutions. For instance, 'Energy on Location' (EPL) regulations state particular requirements for producing energy used on a private plot. However, sometimes it can be more efficient to outsource energy production to solar panels or wind turbines on other semi-private, or public locations. Because this energy is no longer produced on location, it is not allowed, even though a different arrangement might be beneficial for both parties, from an energy-saving perspective. These types of issues call for ways to formulate requirements that are more focused on outcomes, rather than on specific rules to achieve them. This sentiment resonates with broader societal discussions about the introduction of 'doelwetgeving', meaning that laws and regulation shouldn't describe what someone should or should not do, but rather which goals should be realized – thus leaving more room for broader innovative applications.

Conclusion

The City Innovation Game Buiksloterham contributed, in various ways, to the notion of the hackable city. Firstly, the game reinforced different actor's commitments to collective action, and served as a tool for collaborative storytelling and agenda building. Secondly, it helped align various actors to contribute to, and learn from, a collective knowledge base. Thirdly, it foregrounded the need for particular governmental frameworks that underwrite their agenda, yet at the same time provide enough flexibility to innovate. Finally, game sessions could serve as a means to communicate relevant issues to lawmakers and regulators.

Metrics for Collaborative Building Groups

How can we evaluate the results of alternative models for area development, like collaborative building groups? And how can their underlying public value be recognized, and institutionalized, for instance in new area development tenders? These were the main questions we investigated together with Beleef Buiksloterham – a coalition of architects, developers and collaborative building groups that experiment with a cooperative and sustainable model for development, in Buiksloterham.

Metrics & Indicators for Collaborative Building Groups

Building groups: an alternative model for area development

In the Netherlands, most area development is managed top-down by local governments, in cooperation with (private) developers. When this model came to a halt due to the 2008 finance and real estate crisis, a new model emerged in Buiksloterham. A number of developments could not be realized, these lots were relabeled for citizen-driven real estate development. The lots consisted of plots for individual self-builders, as well as plots assigned to small 'building groups', for the development of medium sized apartment complexes.

Exemplary within this shift was the development of lots 12, 21 and 22, in Buiksloterham. These lots were part of a 'sustainable tender' that required specific conditions with regard to the sustainability of the housing projects. When the original developer for lot 21 pulled out, it was reintroduced in the form of six subplots, each to be developed by a collaborative building group. These building groups consisted of the prospective apartment owners, and were usually managed by a contractor or an architect (who was often also a future resident).

Although each of these building groups developed their own building, cooperation between the groups emerged. Together with the architects and developers of neighboring lots 12 and 22, they formed the coalition 'Beleef Buiksloterham'.

Beleef Buiksloterham
Actors involved:

Patch 22
Frantzen et al architecten i.s.m. Lemniskade

Blackjack
BNB architecten i.s.m. BO6 architecten

Nova Zembla
Hans Oudendorp, ArchitectBNA.nl

Superlofts BSH
Marc Koehler architects + Vink Bouw

Noord4Us
Berger Barnett architecten + Vink Bouw

ELTA
One Architecture + Bot Bouw Initiatief

PUUUR BSH
Atelier PUUUR + Vink Bouw

Docklands
ML_A + Vink Bouw

The cooperation between these parties began when the local government decided to stop promoting the area. In response, these architects and developers took this task upon themselves. As a collective, they organized open days and information markets, and used social media to promote opportunities for future residents to become active participants in their building groups. They also started to exchange knowledge and coordinate their activities, for instance by cooperating on the development of provisions for collective alternative energy.

The leaders of these building groups explained they worked in the 'in between dimension' (tussenmaat, see also the study by Vincent Kompier on this phenomenon)[1]; with regard to the scale of development – they find themselves in between large project developers and individual self-builders. Similarly, their position combines advantages on both scales: they work closely with future residents while designing their projects, whilst providing the certainty of professional guidance and funding.

Residents are involved early on in the building process, and cultivate a sense of ownership and commitment to not only their houses, but also their future neighbors and their neighborhood. Because the scale of individual projects is small, and the architects are determined to work within the framework of the circular economy, these projects offer a lot of room for innovation.

At the same time, because the groups formed a larger network, together these projects can produce housing units at more or less the same pace and scale as the traditional developer-driven model. In total, the number of apartments realized by the six building groups in Beleef Buiksloterham is similar to the number of units in the original single-developer plan.

Organizing collectives around the production of houses in this way can be understood as a 'hack' of the traditional system. Housing production is organized in new ways, by new coalitions, who work much more closely with future residents. These projects were also able to base their builds on alternative values, like sustainability.

For the time being, this is a one-off facilitated by the financial crisis. To what extent is this model superior to traditional ones, and can new regulation safeguard it? How could tenders be written so that collaborative building groups can find their way into city planning, in the Netherlands? So, how can the performance of these building groups be measured, and presented for demonstration? In what sense is development through a network of small-scale building groups different, better, or perhaps equal to traditional building approaches?

Throughout this research, a number of workshops and expert meetings were held, during which Beleef Buiksloterham participants, and external experts, discussed values and criteria to measure the success of collaborative building groups. With consultancy firm Rebel Group, a number of these indicators were developed further. These values and criteria could play a role in future tenders to ensure and safeguard public and collective values through collaborative processes of area development.

Indicators & Metrics for Collaborative Area Development

What values, and which indicators, should be used in the evaluation of collaborative area development, how can they be measured, and to what extent can they be translated into new tenders? These were central issues in this aspect of our research.

In traditional housing developments, economic criteria are a strong factor in decision-making processes. In contrast, Buiksloterham has seen a sustainability tender that invited innovative and sustainable practices. Researchers such as Gert-Joost Peek (for instance in his inaugural lecture *Veranderstad*) have argued that there is a further need to shift towards more sustainable and resilient modes of housing production.[2] This means that a broader set of criteria should be taken into consideration during decision-making processes, and tenders.

A number of more holistic criteria-sets for area development have been drawn up over the last few years that could be helpful in this respect, like the BREEAM-NL framework. Yet, alternatives that are open to more integrated and innovative approaches could also be useful here. Kristien Ring's 'Ten Selfmade Qualities' is also an interesting frame for reference. She researched building groups in Berlin, and came up with a number of qualitative indicators that describe how these building groups contributed towards socially and economically inclusive collaborative housing production. These include 'Shared Space, Community & Social Focus', 'Long Term Affordability', 'Custom-Fit Solutions for Every Generation' and 'Investment in Ecological Building'.[3]

During our workshops, the following indicators were discussed as important factors in the evaluation of collaborative building groups.

Economic Performance & Financial Models

On a concrete level, economic performance is most easily quantified. Building costs and returns can be measured in hard data. They are relatively easy to measure considering the standardization of calculating building costs.

It's more complicated to find ways to consider and measure financial resilience. Developments by building groups are characterized by different financial arrangements in comparison to traditional developments. Future residents are involved early on, and they become de facto co-designers; and in some cases co-investors, minimizing traditional financial risks. One Architecture founder Matthijs Bouw explained in his essay for the Design & The City conference that these houses are built with 'real money' for 'real people', rather than financed tharough complex financial constructions, and targeted at an average marketing persona. 'The simple financing model, which to a large extent bypassed project finance loans, risk management committees, credit-board reviews and other manifestations of financialization' allowed developments to continue during the financial crisis, thus making a resilient financial model.[4]

Quality of private, collective and public amenities

Quality of developments can be measured in a number of hard indicators, such as choice of materials, or average ceiling height. More interesting and harder to measure though, are qualitative indicators. To what extent are users satisfied with their houses, and how do these buildings contribute to public values like community building, social interaction, and a sense of neighborhood ownership?

In general, building groups involve future residents early on, resulting in a greater sense of ownership over the outcome and the design of their private and collective amenities. This leads to broader flexibility in designing apartment types, and possibly to an increased sense of ownership towards the greater surroundings.

Innovation & Sustainability

Already there are a number of sustainability indicators that can help us to set minimum standards through tenders. Yet, architect-developers from Beleef Buiksloterham also found some of these problematic, as they are based on a number of traditional assumptions, whereas innovative or alternative aspects haven't found a place yet in these models.

For example, the Energy Performance Coefficient (EPC) measures the energy efficiency of a building, but without taking into account livability factors, the amount of daylight, or the environmental performance of material applications. Following these rules bluntly would result in buildings with very small windows, and lots of isolatable facades covered in PV cells. The building would be 'sustainable' in terms of efficiency, but perform poorly from a more holistic perspective. Similarly, alternative approaches toward insulating a building, for instance by using thick curtains rather than an isolated façade, cannot be measured by this model. How can tenders avoid these pitfalls and accommodate innovation and sustainability?

Pace, Scale & Organization

A much-heard criticism about collaborative building groups is that they are simply not fit to tackle the enormous housing challenges that cities like Amsterdam face. These cities need large-scale developments to be realized in short time spans. For the city, it's easier to deal with a single developer, rather than with a broad range of smaller building groups. However, data from Buiksloterham suggests that the networked mode of operation produced the same number of houses as originally planned in the single-developer mode. And whereas that developer could not deliver, the collaborative building groups did not take longer to complete their apartment complexes than traditional developers.

One advantage of a networked approach is that it increases flexibility and adaptability. Building groups are linked, but not dependent on each other; so if one of the projects fails, the others will not be delayed, leading potentially to higher resilience for the development of an area as a whole. In terms of tenders, there might be a need to recognize coalitions of building groups as one actor, rather than the more binary division often used between large-scale developers, and single blocks or apartments.

Another criticism is that most people won't have an interest in co-creating their houses. The study *Nieuwbouw in de toekomst: meer keuzevrijheid en slimme begeleiding voor de woonconsument* is often referred to as a foundation for this reasoning.[5] This study concluded that most consumers want freedom of choice, but do not necessarily want to initiate the project. Following a closer look at this study, the reverse argument could also be made. Although not everyone wants to commission their own house or apartment, there are quite a large number of people who are interested in being part of the design process. Half of consumers are interested in building their own house, or finishing a hull. Thirty percent are positive about building groups. These kinds of possibilities are rarely afforded in new housing developments, even if the market is in an upswing.

Inclusion & Diversity

Self-building and collaborative development is sometimes criticized for its lack of inclusiveness. To what extent are these approaches mostly appealing to middle and high income residents? At what level are professional knowledge, and social and political networks, required to take part in these projects? These are questions that are addressed by, amongst others, Boer en Minkjan in Failed Architecture.[6]

To counter this, Kristien Ring's research in Berlin demonstartes that 'Baugruppen' can be inclusive. Diversity is an issue that could be worked out in the requirements for tenders, or in the overall financial mix of projects planned for the area.

Need for qualitative indicators

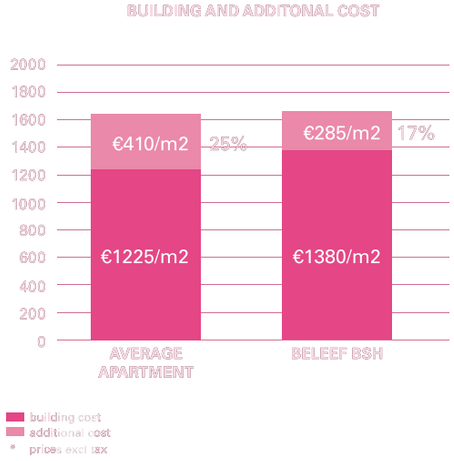
Comparison and/or performance are sometimes hard to express in quantifiable data. An alternative approach could be to look for detailed qualitative descriptions in a small number of exemplary cases, rather than trying to come up with averages. Some indicators that describe the economic situation, like cost, speed and diversity are relatively easy to measure. Non-quantifiable social, cultural and political aspects (like flexibility, customer satisfaction and participation, risk management and an integrated approach) need to be illustrated in different ways.

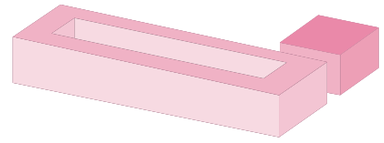
Buiksloterham Indicators

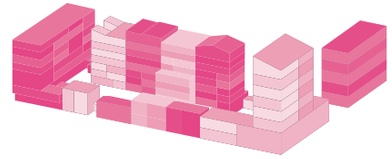
Based on the discussions above, The Hackable City cooperated with Rebel Group to measure collaborative building groups in the Beleef Buiksloterham-coalition based on three criteria: Economic, Quality and Social.

Economic Indicators:

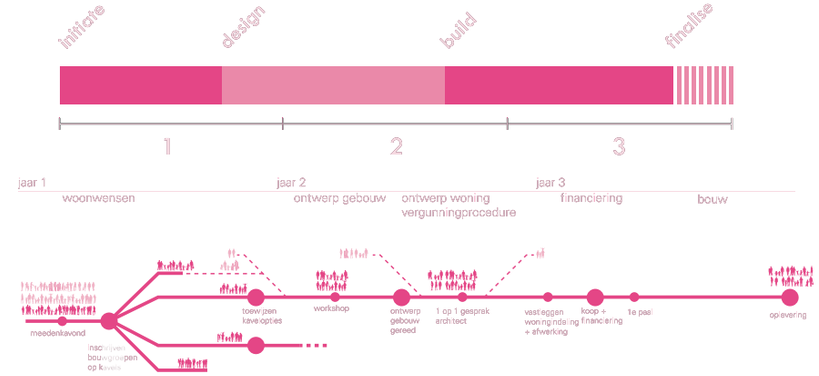
Financial
Development costs for apartments in the Beleef Buiksloterham coalition were close to the average for more traditional developments. Indirect costs, like marketing and transaction costs, were significantly lower, resulting in greater investment in building process and materials.





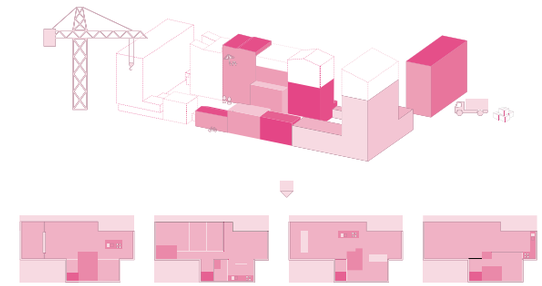


Production Capacity
The number of apartments realized by the six building groups (lot 21) were the same as in the original, single-developer plan. Scale was achieved by creating a coalition of building groups.

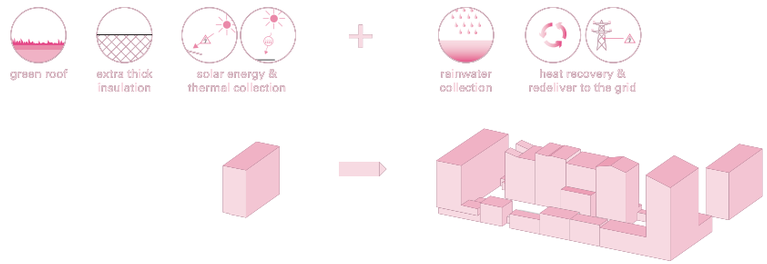


Production Time
Production time was comparable to regular developments. The only difference is that future residents are involved in a much earlier stage.

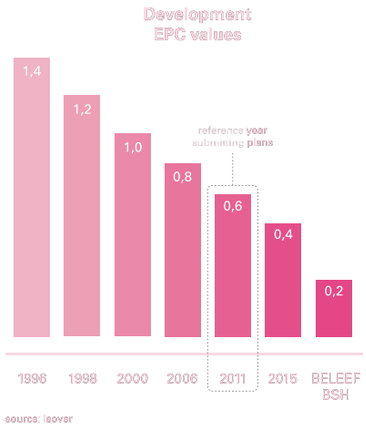
Production Flexibility and Customisation
Whereas building groups collaborated amongst themselves when possible, they were not dependent on each other. They followed their own pace throughout the building process. This makes the trajectory, as a whole, more resilient. If one development lags behind or fails, the others can still continue – the impact on overall housing production is minimal. So far, this customization hasn't led to a decreased resale value.
By involving future home-owners early in the process, both their houses and collective amenities, can be designed to suit their preferences. This leads to a diversity of apartment types and interiors. It also helps increase market reach, as different housing preferences can be accommodated.



Quality Indicators:



Sustainability
The local government played an important part in setting the standard for development. These lots were part of a sustainable tender, meaning that proposals followed particular guidelines in terms of sustainable building. However, the architect-developers did not view these criteria as a minimum they needed to satisfy, but in many cases surpassed the requirements, investing in sustainable materials and innovating with new construction types and development models. Many of the buildings in the coalition provided sustainable solutions, like green roofs, rainwater collection and geothermal heating systems.



Energy consumption
Beleef Buiksloterham-architects realized an EPC-score of 0.2 (Energie Performance Coefficient), which was lower than the 0.6 requirement for the lots.

Innovation
Beleef Buiksloterham-architects innovated in their construction methods, their facades, and by determining the interior lay out of their apartments. This resulted in a broad variety of buildings and apartment types, from small studios to large lofts, and from artists' ateliers to an apartment hotel.

Social Indicators:

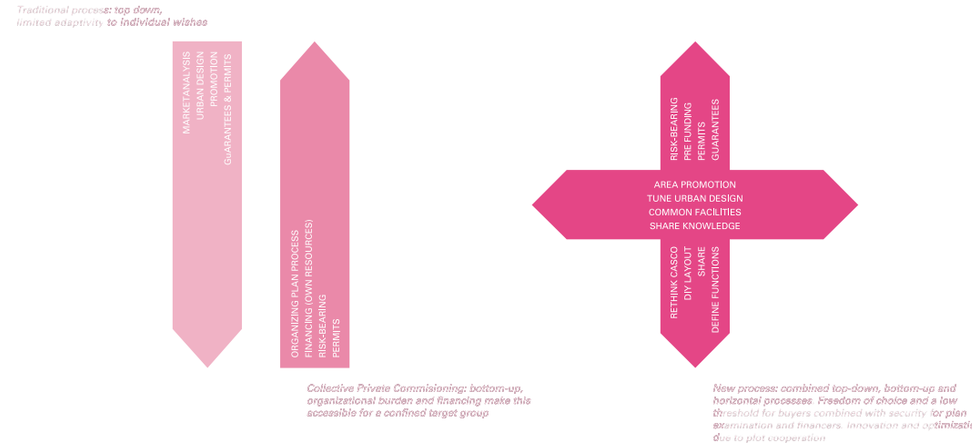
Demand driven development
The collaborative building group model provides future residents with many opportunities to co-design their apartment buildings. Numerous workshops were held in which they presented their vision about both private and collective amenities. In this way, development could be custom-tailored for the market, a wish standard housing production could not supply or honor.

Diversity
The opportunity to influence the size and design of apartments resulted in a relatively mixed group of residents, consisting of young families, older couples, and singles, and include home-offices for the self employed. In terms of income and cultural background, the population is less diverse.

Community, Collectivity & Ownership
Workshops in the early phase of the building process contributed to community building, as well as the development of collective projects, like a geothermal heating system, and the inclusion of collective spaces in the buildings.

Customer Satisfaction
Interviews concluded that residents are satisfied with their apartments. They especially valued direct contact with the architect-developers. The relative small scale of individual building groups allowed them to grasp the project as a whole, and facilitated a sense of collective responsibility.

On the flip side, involving residents early on led to an extended involvement in the building process, which some experienced as cumbersome. Some felt communication could have been more streamlined.



Conclusion

Beleef Buiksloterham can be understood as an experiment in cooperative area development. Six building groups, and two other sustainable developments, began cooperating in various ways – for promotion, energy provision, knowledge exchange and building. In the different building-groups, future residents were involved in the process early on, and became co-designers of these developments, resulting in a broad variety of apartment types.

Beleef Buiksloterham enabled various parties to cooperate, and together realized the same scale housing developments, at the same pace as regular developer driven approaches. Their efforts led to the production of high quality innovative housing, partly due to the fact that this development originated from an ambitious tender that demanded high levels of innovation and sustainability. Furthermore, the developments were financed by architects, contractors and future residents, rather than existing financial markets – making these developments less sensitive to unpredictable economic conditions.

Because these houses were realized during the financial crisis, non-economic values like sustainability, and collectivity, became more prominent. Beleef Buiksloterham can be understood as an alternative model for area development, based on a different set of values and principles. These values and principles could be used to inform future housing developments. This model pairs ambitious sustainability guidelines with a cooperative approach, via architect led building groups. It can be described as a resilient one, economically, socially and environmentally.

[1] Vincent Kompier and others, 'Ruimte Voor de Tussenmaat', *Lay-Out. Platform Voor Recent Ontwerpend Onderzoek*, 2012.
[2] Gert-joost Peek, *Veranderstad. Stedelijke Gebiedsontwikkeling in Transitie* (Rotterdam: Rotterdam Hogeschool Uitgeverij, 2015).
[3] Kristien. Ring, *Selfmade City : Berlin. Self-Initiated Urban Living and Architectural Interventions* (Berlin: Jovis, 2013).
[4] Matthijs Bouw, 'Economic Resilience at Buiksloterham', *Design & The City Newspaper* (Amsterdam, 2016) <http://designandthecity.eu/essays/economic-resilience-at-buiksloterham/>.
[5] DBMI, NIROV and Nieuwbouw Nederland, *Nieuwbouw in de Toekomst: Meer Keuzevrijheid En Slimme Begeleiding Voor de Woonconsument* (The Hague: Nirov, DMBI and Nieuwbouw Nederland, 2012).
[6] René Boer and Mark Minkjan, 'Self-Builds: Between Unruly Real Estate Markets and Failed Housing Policies', *Failed Architecture*, 2016 <https://www.failedarchitecture.com/self-builds-between-unruly-real-estate-markets-and-failed-housing-policies/>.

Epilogue

This research project about the hackable city, was for us, the academics editing this report, conceived as a novel cooperation between researchers from two universities, and a variety of partners from the creative industries and the national government; each bringing in their own perspectives to the theme, collaborative citymaking in the network society.

As researchers grounded in academia and the university of applied sciences, we have a long standing interest in the relationship between new media and urban culture. We've been involved in earlier studies and projects about the topics smart cities & citizens, civic media, and digital placemaking.[1] During our research, we often enquire critically, reasoning from a normative framework that considers developments in the fields of technology and society from a standpoint of public value. To what extent could and/or do emerging practices surrounding digital media contribute to, or inhibit the empowerment of citizens in an inclusive, democratic society?

As a practicing office for architecture and urbanism, One Architecture contributed from a different angle. A long-standing advocate for actor-based planning models, One Architecture is interested in exploring new roles and business models that give more agency to architects and designers. The rise of social media and other digital platforms holds the promise that citizens become more active themselves, in processes of citymaking. However, although these initiatives have often been described as bottom-up, on closer inspection, professionals often play an integral role. One Architecture aims to better understand this emerging dynamic, and the future potential for designers in these new roles and processes.

In addition, One Architecture also signaled the need to understand the underlying structures of collective organization around local issues, on a deeper level. Governments and other institutions seemed to lack the proper frameworks to fully understand, value and stimulate these types of initiatives – and connect professional-led collective organization with their own democratically established policy goals. Citylab Buiksloterham, Pakhuis de Zwijger and the Ministry of the Interior all shared a similar vision.

Combining academic, critical and normative perspectives, with the experiences of urban planning professionals, brought us to the starting point of our chosen process, research through design. We drew up a framework for the hackable city, that served (at various points during our research process) as a hypothesis, an analytical framework, a set of principles informing the design process – and a lens through which emerging practices of collaborative citymaking could be explored, understood, examined and shaped.

The hackable city began as a hypothesis or an 'imaginary', an alternative vision for the future city that combines top-down smart city technologies with bottom-up smart citizen initiatives; that utilizes digital media technologies to democratize the process of citymaking, from a public interest perspective. Why is such a future desirable, and what could it look like? What would it take to realize it? And what are the challenges? What new roles emerge during this process, and how should citizens, institutions and professional's work together?

Once we started studying examples of collaborative city making, and exploring this process via our own design probes, the hackable city began to evolve as an analytical model to understand these practices; from which design principles and (design) research questions could be derived. At the same time, the central metaphor of 'hacking' allowed us to approach this research theme through a critical and philosophical lens. (See *Cahier #1 The Hackable City. A Model for Collaborative Citymaking* for further details about the various perspectives that come together in the hackable city).

It was precisely this multiplicity that propelled our research throughout the design process. It enabled us to translate a hypothesis about the 'preferred state' into a set of design probes, helped us explore both the problem space, as well as tools and processes. Moreover, our design probes instigated further discussion about hackable citymaking as an ideal, and as a practice. This model informed the design of our probes – whereas our design and evaluation sessions organized to evaluate the probes – further informed the model taking shape.

With this combination of research we hoped to address a recurrent issue in academia: the gap between applied research, and critical and normative inquiry. Technical scholars and business stakeholders, who shy away from engaging with social theories and normative philosophy to think through the consequences of their work for society at large, usually do applied research.[2] Scholars in the humanities are mostly interested in cultural critique, but often shy away from involving themselves in the development of actual alternatives. The hackable city is an attempt to bring these two ways of working together; to contribute to both the normative debate about the future city (in what kind of smart city do we want to live?), as well as to provide professionals and institutions with an 'action horizon': how can they understand their own roles, and what tool sets can be employed during the process of collaborative citymaking.

Future research

We think that both our probes, as well as our hackable city-model, are well suited to inform future research and practice. Think of the hackable city model as a lens, to help focus on a more precise view and contextualization of the problem space; as well as sharpen the vision of a future preferred state, within the field of collaborative citymaking. In comparison to our explorative approach, this could lead to a more structured design-research approach, and help tackle particular challenges or issues during different phases of the city making process.

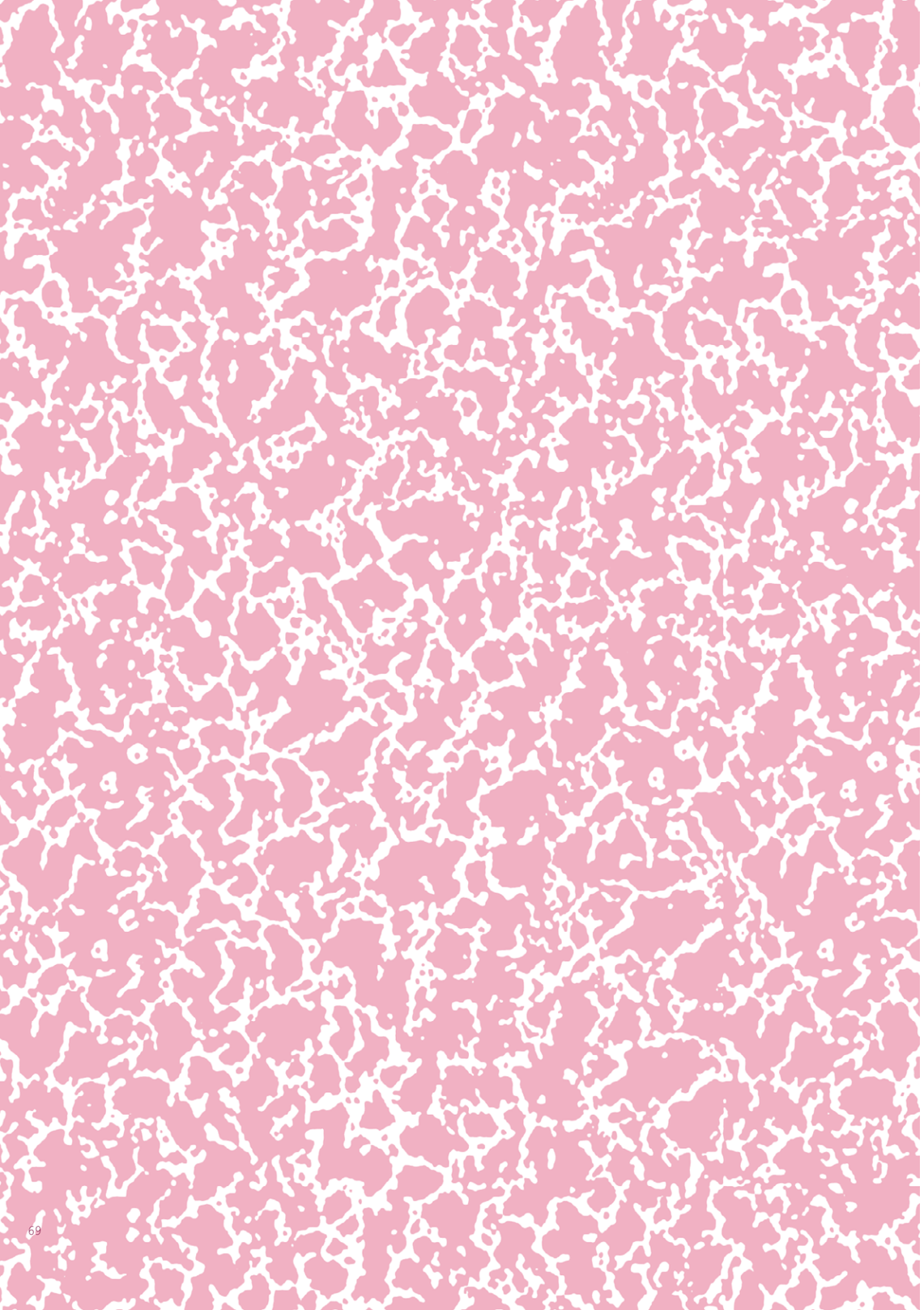
In the future, the hackable city model could be made more concrete by focusing on a single dimension of the model, for instance, developing prototypes (rather than mere probes) that are useful in these situations. Particular expertise from other disciplines could also contribute additional knowledge and insights. Fine-tuning the model could also be achieved by zooming in on the three nodes: individual, collective, institutional – and further exploring their 'internal' dynamics. For instance, we discovered on an institutional level, similar dynamics between individuals with a 'hacker mentality', and collective values and practices.

Because our process was purposefully explorative, we chose to test a variety of probes. This approach forwent more traditional systematic research into the functionality of the probes as actual tools. Therefore we truly recognize them as probes – literally meaning small devices used for measuring, testing or obtaining information – rather than full-blown prototypes. Our probes are functional, and embody features that explore intriguing concepts within the domain of (urban) interaction design. Yet, they still need to be developed and grounded further in existing theory and practice, for future iterations.

A number of our probes seem particularly promising. The City Innovation Game Buiksloterham is already part of a larger repertoire of city games developed by the Play the City Foundation, that are used as actual tools in collaborative citymaking. The International (Self)Building Exhibition addresses the urgent issue of how to organizing knowledge exchange platforms for collaborative building practices. Similarly, The Metrics & Indicators for Collaborative Building Groups is an important impetus for opening up the discussion about the preferred state for area development, and operative values during this process. Researchers with a background in area development could, together with city officials and professionals, further develop criteria proposed here, in order to explore how it could be implemented concretely into tenders. On a more abstract level, our model could be further exploited in theories and discussions on urban governance and urban sociology.

For practitioners, The Hackable City model can help both professionals and institutions, reflect on their roles, and the wider context in which their activities are embedded. This model can be used to think through actual frameworks for citymaking, as well as aid professionals in structuring new initiatives, by using it as a dynamic guideline. Furthermore, by analyzing our probes in this Cahier, we hope to inspire concrete designs, methods and fresh organizational models.

In this way, The Hackable City is no longer just an 'imaginary' aspirational model, but truly contributes to collaborative practices of citymaking in a democratic society.



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Colophon

The Hackable City is a research project that explores the potential for new modes of collaborative citymaking in a network society. The team's primary case study is Buiksloterham, a brownfield regeneration project in Amsterdam North.

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 executed by Cristina Ampatzidou, hosted at the University of Amsterdam and One Architecture and funded by the Creative Industries Research Centre Amsterdam, with contributions from Utrecht University.

In 2013 funding was received from the Netherlands Organization for Scientific Research (NWO) for a KIEM-exploration (lead by Michiel de Lange at Utrecht University). And in 2014 NWO funded the programme as a Creative Industries research project hosted at the University of Amsterdam, The Amsterdam University of Applied Sciences (AUAS), and One Architecture (lead by Martijn de Waal at Amsterdam University of Applied Sciences and University of Amsterdam).

In 2016 with Delva Landscape Architects, Studioninedots and Stadslab Buiksloterham the entry Hackable Cityplot and a series of events was developed for the International Architecture Biennale Rotterdam.

Research institutions

Amsterdam University of Applied Sciences; Lectoraat Play & Civic Media
University of Amsterdam
Utrecht University

Partners

One Architecture
Stadslab Buiksloterham
The Ministry of the Interior and Kingdom Relations
Pakhuis de Zwijger

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Probe design

The International (Self) Building Exhibit Buiksloterham: Lipika Bansal, Tara Karpinski, Melvin Sidarta
The Water Game: Michiel de Lange, Karel Millenaar (Game & Visual design), Froukje van de Klundert
Walking on Sunshine: Tara Karpinski
Play the City Buiksloterham: Ekim Tan (Play the City Foundation)
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