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Generativity revisited. Participatory Design for self-organisation in communities

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Generativity revisited. Participatory Design for self-organisation in communities

Societal trends, such as the governmental withdrawal from the public realm, increasingly motivates communities to self-organise in taking care of it. As a result, designers have explored the concept of 'generativity' as a quality of design that supports communities in questioning, supporting and giving form to self-organisation in the public realm. Nonetheless, a thorough investigation of how to enable generativity in the context of community-based PD is lacking. When designers give form to generativity, they intend to allow people to 'self-organise' by transforming and using infrastructures through and for debating and creating public matters, without assistance from the infrastructure's original designers. While design for informatics defines generativity with a focus on “self”-organised processes, we conclude that generativity in the context of designing for the complex politics of the public realm is a quality that mainly supports communities' “co”- organisation. We describe the generative quality of design in the community project Betty's Garden and discuss how the specific roles and capabilities that were developed by the community and by us as researchers contributed to this quality.

Keywords: participatory design, design research, case study, design theory, user participation

Introduction

In Western cities, we observe an increasing withdrawal of governments from the organisation of public life and increasing privatisation of public space (Christopherson, 1994). This combination forced citizens to organise themselves in taking care of the public realm, using information infrastructures. Information infrastructures are technological or non-technological elements that support networks of people and organisations in their activities (van Dijck, Poell & de Waal, 2016; De Lange & de Waal, 2019). We discuss information infrastructures as central elements within infrastructuring processes. Within the fields of Participatory Design (PD) and Computer-Supported Cooperative Work (CSCW) infrastructuring is defined as the behind-the-scenes work of building, adopting and appropriating information

infrastructures that support people for their long-term engagements (and self-organisation) in their situated spatial and social contexts, as we will demonstrate through a case study of a community garden (Karasti & Syrjänen, 2004; Karasti & Baker, 2004; Lenstra & Baker, 2017; Martilla, Botero & Saad-Sulonen, 2014; Seravalli, Eriksen & Hillgren, 2017).

This societal context has also motivated designers to investigate 'generativity' as a quality of information infrastructures (Karasti, 2014), as these infrastructures are always designed for people to change them. Generativity describes the process of people adopting and appropriating information infrastructures to achieve their own goals, without assistance from the infrastructure's original designers (Zittrain, 2006; Van Osch & Avital, 2009). Generativity is often considered as an inherent technical quality of digital information infrastructures that allows people to organise things (e.g. knowledge in the case of Wikipedia) for and by themselves. In these definitions, generativity supports “self”-organisation. However, when working with communities that engage with the complexity of the public realm (referred to as community-based PD), additional aspects are at play (cf. Bødker, Dindler & Iversen, 2017; Karasti, 2014). In these contexts, PD processes not only involve an engagement with the technical issues of generative infrastructures, designers also have to engage with situated social and spatial contexts, where political concerns explicitly come into play (e.g. ownership of land, unclear responsibilities in maintaining public goods).

This attention for political concerns is why infrastructuring processes depart from the concept of democratic dialogues. In previous work, we defined democratic dialogues as something that designers and communities engage in to guide the building and adapting of information infrastructures within a social and spatial context (Huybrechts, Dreessen, Schepers & Calderon Salazar, 2016). In design processes that

are structured via democratic dialogues, the idea of what “self”-organisation means in the context of generativity needs to be critically probed. Horelli et al. (2015) state that self-organisation allows communities to challenge power imbalances, complementary to formal participation processes. Although their research showed how ICTs could support communities in community gardens, they express the need to research further communities’ relations with decision-making in urban settings. Our goal is to deepen the understanding of how self-organisation evolves in infrastructuring processes with communities in the public realm, particularly by addressing these power imbalances through the process of organising democratic dialogues. We explore this through the question: "How can we give form to democratic dialogues between designers and citizen communities, that can support a more politically aware design of information infrastructures with generative qualities in the context of the public realm?".

In on-going research, we explored how designers can setup dialogues (Huybrechts, Dreessen & Hagenaars, 2018) in design processes dealing with the public realm with an eye for these dialogues to be self-organised at a certain moment (i.e. further adopted and taken care of by the community (Burns et al., 2006; Sangiorgi, 2011)). The development of these democratic dialogues with communities entails political challenges and to enhance the generative qualities of this co-creation process, designers should use democratic dialogues to build capabilities together with communities. To fully understand generativity, we further explore how communities (self-)organise these dialogues. While previous work focussed on the position of the designer in generative processes, this paper investigates how communities initiate democratic dialogues and strengthen their capabilities in self-organising engagements within and outside their communities, using information infrastructures.

Literature

This literature review focuses on introducing the core concepts of this paper: generativity and democratic dialogues. First coined by Erikson (1950, p. 231) in his model of psychosocial development as an "*interest to establish a next generation*", the notion of generativity knows different interpretations. When discussing the design of IT systems, the term describes the automatic generation of code (Czarnecki & Eisenecker, 1999). In computational generativity (e.g. media arts), the technological system becomes an evolvable object as the generative character of the algorithm designs new patterns. More socio-technical interpretations apply generativity to describe the potential of technologies to support distributed communities (of people) to engage collectively in bottom-up evolving processes of creation, transformation and innovation (Zittrain, 2008; Avital & Te'eni, 2006; Van Osch & Avital, 2009; Avital, 2011). Generativity within the field of PD often refers to 'collective generativity'; i.e. design problems are solved using the collective generativity of designers and participants instead of the individual creativity of designers (Sanders 1999). In line with the socio-technical definition of generativity and PD, we studied how documentation can extend design processes by allowing participants to elaborate on the design after project completion. In this sense, generativity is approached as developing documentation strategies that enable people to elaborate upon the designs and information infrastructures generated during the design process (Huybrechts, Schoffelen & Hagenaars, 2014; Huybrechts, Storni & Schoffelen, 2014).

We contribute to the existing discourse on generativity by investigating how this can be built with communities in the public realm with sensitivity for its political challenges. In community-based PD processes, information infrastructures that support generativity are not only made for but also built together with communities. In these community settings, it is vital to enable community members in appropriating these

information infrastructures to their needs and contexts (Iaione, 2016). Therefore, communities should be provided with information and documentation of the information infrastructures but also supported in building capabilities to use and adapt these infrastructures. Therefore, we approach generativity as a process in which these infrastructures and capabilities are built, via democratic dialogues.

The concept of 'democratic dialogue' stems from the field of PD and refers to the idea that everyone affected by a design process can control or direct the conversation (Gregory, 2003; Miettinen, 2004). Democratic dialogues are a way in which PD processes give form to systems, projects, services and take place in backstage (e.g. building relationships through informal contacts) and frontstage activities (e.g. co-design workshops) (Dindler & Iversen, 2014). When considering this lens of democratic dialogues to generativity in community contexts, the goal is to design information infrastructures that support communities to continue this process of creating democratic dialogues themselves. Designers take on different roles in democratic dialogues to nurture a 'collective' capability building process in which they - together with communities - learn to use and further develop information infrastructures to self-organise around concerns (Le Dantec & Fox, 2015; Huybrechts et al., 2018; Smith & Iversen, 2018). In previous work (Huybrechts et al., 2018) we defined these democratic dialogues, initiated by the designer, and directed at building capabilities with the community in which the designer is embedded. These democratic dialogues consist of five types with corresponding roles, capabilities and supportive information infrastructures (Table 1).

Democratic dialogues	**Designer role**	**Capability**	**Information Infrastructure**
Strategic	catalyst	align the views of actors	maps
Connecting	triggers of public	uncover, strengthen and create relationships	online platform
Questioning dialogues	activist	discuss the status-quo to initiate change	signs or pamphlets
Agonistic	match-maker	bring together alternative voices in tangible ways that make doubt and disagreements visible	intervention in public space
Expressive	co-designer	design together and provide tools for ideation and expression	design game

Table 1: Democratic dialogues and designer roles

The lens of democratic dialogues makes explicit how designers can co-design information infrastructures with a community and how they can build capabilities to support the appropriation and continuous design of these infrastructures. To analyse the design process' generative quality and critically probe what “self”-organisation means, we investigate how these democratic dialogues are initiated by the communities themselves and how this relates to the designer's efforts. This study of designers collaborating in communities can be framed within PD that has moved beyond staged projects with communities of practice in workplace settings to more open-ended design processes with communities of interest in urban settings (DiSalvo et al. 2012; Unteidig et al., 2017). Examples of these settings are urban gardens (a.o. Frangos, et al., 2017; Heitlinger, et al. 2018; Marttila & Botero, 2016; Montuori, Rosa & Cecilia Santos, 2017; Rice, 2018). According to Fernandez and Buch (2003, p. 3), these gardens

function as "*catalysts for building social capital and social cohesion by establishing networks that enable collective action*". In this sense, through the practice of urban gardening designers and communities can address the cultural, social and political dimensions of the public realm in a meaningful way (McKay, 2011; Frangos & Imbesi, 2014; Scheromm, 2015).

Case study: Betty's Garden

To investigate the questions mentioned above, we describe the case of 'Betty's Garden': a community garden in Genk, Belgium. Betty's Garden illustrates how a community re-appropriated a garden of 17 acres in the middle of the city as a green space to: unite the rich cultural diversity of neighbours; decrease the car-focus in its street and enhance its role as interface between nature and city-life. While many garden initiatives exist in the city, this one is citizen-driven and aims to share decision-making in urban space.
The 25 members are local volunteers, and although they try to attract a younger and female audience, the majority is male and retired. The community became part of our Living Lab, called 'De Andere Markt' (cf. The Other Market). 'De Andere Markt' (DAM) is a collaboration between LUCA, School of Arts, University of Hasselt and the city of Genk to collaboratively design opportunities for work in the city through initiating several design processes (a.o. redefining an old railway track) and communities (e.g. local hiphop community).

The Living lab has a physical space that serves as an informal public meeting place and incubator for local initiatives. During our collaboration with the community garden, we experienced how the volunteers started taking up new roles in designing with us and for themselves. Therefore, this case serves as a good practice to analyse the types of community-initiated dialogues, the capabilities that were built and how generativity took form, from a community perspective.

Methodology

The findings are based on two years of ethnographic fieldwork through participant observations, unstructured and informal interviews and design workshops together with the community. Besides frontstage activities (e.g. design workshops), this fieldwork mainly occurred during backstage activities (e.g. gardening, community meetings, neighbourhood events). Two designers from DAM (first authors of the article) were involved in organisational aspects of the garden (i.e. monthly meetings), but also in the actual gardening. Furthermore, through the integration and collaboration with DAM, the community became involved in different design processes.

The field documentation was analysed and firstly coded in an open way to find patterns in the data (categories of infrastructures, capabilities, designer and community roles). For instance, a collaboration of the community with the local winemakers guild to process the garden's surplus of grapes, received the code of community roles and capabilities, whereas the infrastructures used to find partners were the online platform and DAM's meeting space. Further deductive coding occurred conform the theoretical typology of democratic dialogues in order to zoom in on the implementation of generativity within Betty's Garden. The collaboration with the winemakers' guild was further labelled under the code of collaborative dialogues. Another example was the designer role of 'co-designer' who uses the infrastructure of a co-design game to design parts of the garden together with the community. Through a comparative analysis, we refined the set of democratic dialogues but also distinguished a set of democratic dialogues that were initiated by the community members.

In the following section, we describe how the democratic dialogues initiated by the DAM-team supported the building of capabilities with the community. Next, we outline the emergence of community-driven democratic dialogues. The interplay between both types of democratic dialogues increases our understanding of the

dynamics of designing information infrastructures and capability building, and its contribution to communities' self-organisation. Although this research did not require ethical approval, the designers discussed the research purpose with all members who also provided their consent.

Findings

Through activities of DAM, the DAM designers got to know Betty's Garden. During a long process of backstage work, two DAM designers first built a relationship with the garden's chairwoman and became members of the community afterwards. The geographical proximity (DAM lies adjacent to the garden) but also through their involvement in activities of the garden, the designers created a presence in the community. Furthermore, the integration of the garden in the DAM-network generated new relationships between the garden and other organisations, increasing the number of volunteers and collaborations with Betty's Garden.

Democratic dialogues: a designers' perspective

By zooming in on the democratic dialogues and designer roles, we investigate how democratic dialogues contributed to the design of information infrastructures and capabilities that the designers and the community built in this exchange. The community on their part used, appropriated and further developed these information infrastructures based on their practices and needs.

The designers as **catalysts** build capabilities with communities while engaging in **strategic dialogues** with public, private and citizen-driven organisations to democratically give form to the design brief, the process and the design outcomes. These dialogues mainly took place when the designers initiated meetings with the city and the community to discuss the garden's future and set up a process to rebuild an old

shipping container into an ecological and multifunctional space. This container could make the garden visible in the urban space and position it as an interface between nature and the neighbouring retail. The DAM-team gathered colleagues from various educational programmes (i.e. architecture, environmental technology, product design) to embed the container-project within the curricula to instigate research into the possibilities of the container with little financial means. The capabilities during these dialogues involved: finding funding and partners, working in an interdisciplinary way and describing the project in a way that benefits all parties. Throughout the process, the DAM-team engaged the community to apply for funding and organised meetings and joint writing sessions. However, since the community members found it hard to motivate themselves for this, one designer almost entirely wrote the first application. This lack in motivation may indicate that the information infrastructure - the funding systems, forms and procedures - are not part of the community's practices and had to be mediated by other infrastructures. As a result, the designers set up playful workshops for idea generation and writing to overcome the unfamiliar reality of funding applications and assisted the community in bringing their ideas to paper.

Figure 1: Betty's Garden (by Giovanni Gorga)

The designers as **'trigger of publics'** engage in **connecting dialogues** to capture and strengthen relations within the neighbourhood (Le Dantec & Di Salvo, 2013). The information infrastructure they used was a mural for Betty's Garden. This mural (Figure 1) entails a multilingual poem that describes the origins of the garden. The prominent presence of the mural supported its role as an information infrastructure in the neighbourhood, exposing the garden to attract more volunteers. During Betty's Garden activities, the designers continued to give form to these connecting dialogues via interventions with DAM's cargo-bike, using different information infrastructures. The first infrastructure was the cargo-bike's printing press that supported the designers to create posters with volunteers and sympathisers of the garden. These posters depicted their skills and related to stories about how to use these skills in creating opportunities for work in the city. Another infrastructure were the resulting skill-posters (Figure 2) that were used to connect people and communities over time and space. A third

information infrastructure was an online database that collected the inventory of skills. The DAM-team mapped all skills concerning the garden and visualised the relations between people to reveal the city as a rich resource and network of skilled people. The central capability within this dialogue was to notice and collect skills by using the information infrastructures (i.e. the skill-posters and the online database).

Figure 2: Volunteer with skill-poster

Referring to the idea of minor design activism (Lenskjold, Olander & Halse, 2015), the designer as **activist** builds capabilities with the community to collaborate with the city, to realise their goals from within the existing power relations. This role was evident in the sense that DAM, the community and the civil servant who was engaged in Betty's Garden, collaboratively started to use the skill-posters and stories to place issues on the policy agenda. For instance, after numerous fruitless attempts to persuade a nearby restaurant to stop placing its waste container next to the garden's entrance, the issue was addressed through a story of one of the volunteers when talking about her skills and her desire to use these skills to create a healthy and beautiful street. These posters and stories were shared at a meeting with the city, which led to the city creating a temporary place for the waste container further down the street in anticipation of an underground waste collector system. The printing press and posters thus allowed

the volunteers to share stories, with a playful activist aesthetic, as constructive ideas for the future of the garden. These **questioning dialogues** formed through building capabilities with the community to publicly disclose the documentation of what they cared for through various information infrastructures. Presenting the printed stories via DAM's online database, social media, in the city (people's work- and living spaces) as well as in the physical space of DAM revealed and changed prevalent power relations. It increased the visibility of (the volunteers, their attachments, activities and network of) Betty's Garden in the city and led to the garden obtaining an example function as a citizen initiative, subsequently attracting more governmental support. Hence, in these questioning dialogues, designers and community build capabilities to publicly communicate their capabilities in making a different city through various information infrastructures.

In **agonistic dialogues**, designers as **match-makers** built capabilities with the community in daring to confront the different types of skill-posters with stories about how they would use their skills to contribute to futures for the city. Combining the documentation of the interventions in the garden and those of other DAM projects, led to new confrontations and collaborations. In these dialogues, the DAM-team used workshops and online documentation as information infrastructures to connect people and organisations with Betty's Garden. These agonistic dialogues aimed to show the diverse skills and visions on work in the city and build capabilities in using - instead of avoiding - this diversity in matchmaking between - at first sight - unusual partners. All skills and stories were documented online and could be explored in different relations: their collaboration in events and projects, spatial proximity or when collected (Figure 3). In the physical space of DAM, people and organisations with different skills and aims could meet informally, but also in organised workshop settings.

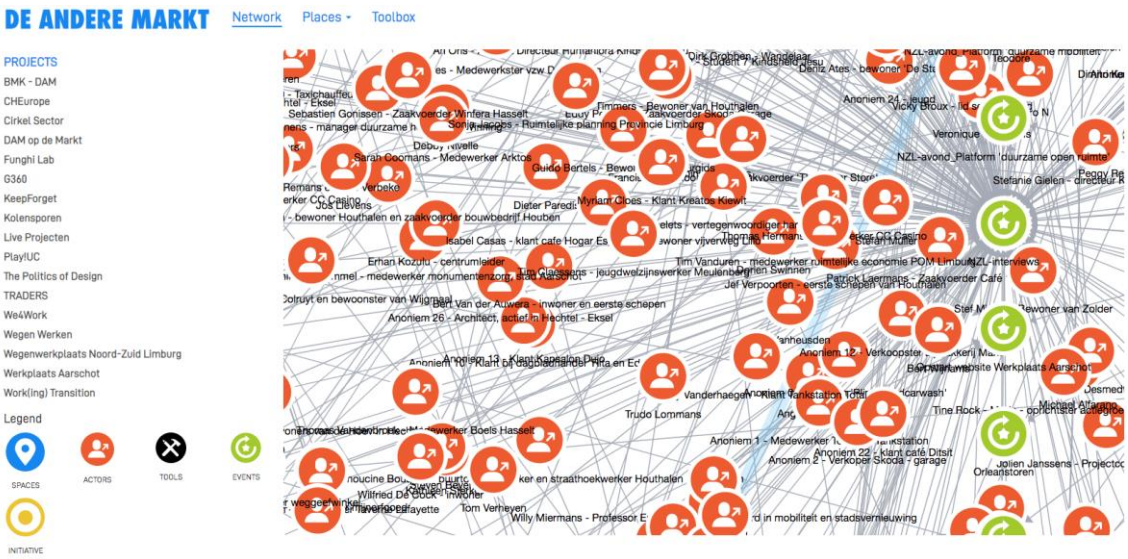

Figure 3: The DAM network

The designers, as **co-designers**, engaged in **expressing dialogues** by building capabilities with the community, aimed at setting up collaborations with others. The goal was to 'make or design' together through various workshops. According to the case-analysis, this role was quite strategic: envisioning the skills and stories needed to create opportunities for work in the city led to rebuilding the shipping container. In one of these workshops, architects and architecture students gathered with the volunteers and the DAM-team to brainstorm on the position of the container within the garden (Figure 4). The DAM-team created a ground plan of the garden and a scale paper version of the container to virtually reposition it. The architecture students suggested several times to remove some trees for a straightforward implementation of the container in the garden, which led to a heated discussion with the volunteers. Mediation from the DAM-team was necessary to clarify that those trees form a distinctive feature of the garden. The main capabilities in these dialogues included: providing participants with brainstorm and prototyping tools and clarifying the importance of being sensible for the skills and concerns of others (Le Dantec & DiSalvo, 2013).

Figure 4: Co-design session on the container project

In summary, the case analysis showed that the designers set up various democratic dialogues in their engagement with the community. The capabilities they tried to build together ranged from putting issues on the policy agenda, communicating the mission of the garden, attracting people to get involved and organising shared projects with (different groups of) people. Various social, technical and spatial information infrastructures (e.g. mural, inventory of skill-posters) were set up and used to support this capability-building process.

Democratic dialogues: appropriation by the community

In this part, we change focus by presenting five community dialogues: organisational, connecting, self-reflective, self-positioning and expressive dialogues. Furthermore, we discuss the capabilities of the community to set up these democratic dialogues, to use and appropriate the proposed infrastructures or set up new ones in their self-organised activities, which forms the key of generativity.

The community as a **co-operator** set up **collaborative dialogues** when the designers were simultaneously on pregnancy leave. Their absence 'forced' the community to take up mediating roles, making use of the DAM-space and network. The volunteers maintained the collaboration with the schools and set up a partnership with another educational institution to rebuild the container. Volunteers adopted the designers' strategic dialogues through a process of learning-by-doing. In these collaborative dialogues, the community agenda was the primary driver to reach out to other actors. Furthermore, building new relationships with local actors required specific skills that they acquired throughout the process: i.e. exploring other actors as future collaborators through the DAM-network. The community used existing information infrastructures (online platform and physical meeting space) to fit their needs.

The community as **generator** started **strengthening dialogues** to search new neighbourhood relations. The difference with the designers' perspective is that these community dialogues aimed to strengthen their community within their immediate environment and not directed at connecting various community-projects across the city. The community also apprehended the potential of expressing skills and stories and used different types of information infrastructures to this end (e.g. appropriating the mural as their logo). In these strengthening dialogues, the community mastered the capabilities to communicate the garden and attract members by using technical, social and spatial information infrastructures created by designers (e.g. network, mural) or by creating new ones (e.g. workshops on branching). Hence, the presence and support of the DAM-team through the different information infrastructures had partly facilitated the community to set up strengthening dialogues.

The community, as an **evaluator**, started to initiate **self-reflective dialogues** about the garden's activities. The container project, collaboratively initiated by DAM

and the community, became a metaphor for this reflection process. As some volunteers expressed that their skills or interests lie in gardening and not in setting up projects, the skill-posters - developed by the DAM-team - were appropriated by the community members to re-distribute tasks. These skill-posters stimulated the volunteers to look critically at their roles and question the overall mission of the garden. To specify: although the garden's original allotment is a fruit tree orchard, vineyard and an authentic marsh, at a certain point they implemented a vegetable garden. After much debate, the community decided to prevail the garden's mission and relate all activities to this mission. By making these different roles, skills and interests visible and by questioning certain activities of the garden, the community showed their capacity to manage their community and critically question its mission. Furthermore, they became a non-profit organisation with a chairwoman, budget and regulations (still on a voluntary basis). In these self-reflective dialogues, the community used the information infrastructures, provided by the designers, but also created new ones to critically set up new internal constellations.

After a thorough reflection process, the volunteers took a **proponent** role and engaged in **self-positioning dialogues**. As the garden is often used by the city to promote its policy on citizen initiatives, the community decided to reverse this strategy by positioning itself as an important actor and applying for city funding. They actively used the skills-posters - collected by the DAM-team - as a tool to attract visitors to the garden, who were eager to learn the backstories of the visualised skills. Instead of using the DAM website, their own Facebook page became the core information infrastructure, borrowing DAM principles. In this sense, the self-positioning dialogues displayed the communities' capabilities to claim a position in the city landscape by foregrounding themselves and mastering DAM's information infrastructures.

Compared to the democratic dialogues initiated by the designers, the community ones were more action and event-oriented. They were less concerned with evaluating their initiatives in the greater purpose of rethinking the opportunities for work in the city. Also, although community members engaged in **organisational dialogues**, similar to the expressive ones initiated by the designers, they functioned more as **co-organisers** instead of co-designers. Specific opportunities or pressing questions prompted their capabilities to set up events. This hands-on attitude was complementary to other initiatives guided by long-term research visions and trajectories: the designers still help writing funding applications. In support of these event-based engagements of the volunteers, the community created information infrastructures that were more suitable for fast, easy and flexible communication (e.g. a Facebook page, a logo) and throughout that process their (and the designers') abilities to use these infrastructures to mediate their events increased.

The community did not try to adopt the designers' long-term way of working (e.g. building a database of skills), because it did not fit their ways of working. Instead, they increased their capabilities to seek partners to take up these supportive roles. As the designers did not anticipate this strategy, it taught them about designing for generativity in the context of the public realm. As the findings indicated, the community did take up the dialogues and roles of the designers throughout the participatory process but appropriated them (Table 2). Although some of the community's dialogues and roles showed similarities with those of the designers (e.g. connecting and strengthening dialogues), the community roles and dialogues were mainly oriented towards the practices and mission of their garden community and triggered by specific events or community needs.

Democratic dialogues	Community role	Capability	Information Infrastructure
Collaborative	co-operator	set up collaborations	DAM network
Strengthening	generator	strengthen the community and attract members	mural, workshop
Self-reflective	evaluator	question the community's mission	skill-posters
Self-positioning	proponent	claim a position within the city	Facebook page, skill-posters
Organisational	co-organiser	set up events with the community and look for partners	Facebook page

Table 2: Democratic dialogues and community roles

Discussion

Generativity in community-based PD is not only about creating information infrastructures and programming a set of rules that support communities to self-organise. To understand generativity in community settings with attention to the political character of the process, we propose to approach it as a dynamic process that is structured by democratic dialogues between designers and community members (Figure 5).

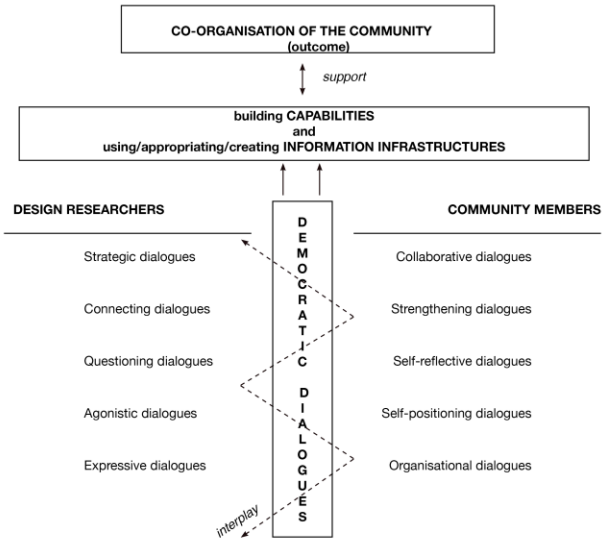

Figure 5: Process of generativity

These dialogues mediate the design of generative information infrastructures (extendable over time, space, people and practices) and capability building to develop them further in a way that pays attention to imbalances in power and impacting decision-making. Throughout the PD process of Betty's Garden, the designers set up dialogues, built capabilities and created information infrastructures that were taken up and adapted by the community members. Our analysis revealed a difference in perspective and rationale for participation between designers and community members and accompanying democratic dialogues and roles (Table 3).

Designer		**Community**	
Democratic dialogues	**Designer role**	**Democratic Dialogue**	**Community Role**
Strategic	catalyst	Collaborative	co-operator
Connecting	trigger of publics	Strengthening	generator
Questioning	activist	Self-reflective	evaluator
Agonistic	match-maker	Self-positioning	proponent
Expressive	co-designer	Organisational	co-organiser

Table 3: Overview of democratic dialogues and roles

While designers initiate dialogues focussed on crossing boundaries between communities; the latter used a - more inwards, intuitive and event-based - approach to set up dialogues and use information infrastructures within their community. We discuss four main insights from the case study.

First of all, the designers had particular capabilities - based on their background in design and ethnographic research - and received support from their organisations to set up dialogues with and within the community. However, the community did not have the means, nor the capabilities or the ambition to become part of the designers' professional community, withholding them from acquiring many of the skills that designers master (e.g. writing funding proposals). Instead, they developed a set of capabilities to match their community with actors who master complementary skills. To initiate these partnerships, they appropriated some of DAM's information infrastructures as well as aspects of the democratic dialogues that they "rehearsed" with the designers. The designers used these dialogues strategically, aimed at appropriation by the larger community within the city, towards long-term effects. Community members used the dialogues more ad-hoc and focussed on their own practices, but by strategically working with the right partners they also formed long-term processes that benefited the larger community of the city. Therefore, it appears to be fruitful - from a political point of view - for designers and communities not to focus on transferring each other’s skills. Instead, the focus should be on showing diversity, complementarities and conflicts, articulating each other’s ambitions, meshing skills and co-learning within a participatory process (Light & Miskelly, 2019).

Second, the community was initially too fragile to function independent from an institutional context. In this sense, the self-organisational quality of generativity is rather co-organisational. Although self-organisation might not be what takes place in

infrastructuring processes, we did see the development of co-organisational relations. Thus, we witnessed a shift from being "supported and managed by" to "supported and partnered in". Community members slowly built relations that benefitted the own community, of which some further developed on a city level (with policy-makers and other actors). In that sense, the goals of the designers and the community grew closer without imposing one goal over another. The main difference in this co-organisational dynamic is that the community's motive to initiate democratic dialogues is to strengthen their organisation. In contrast, the designers envision the city as a system of interrelated communities that can (potentially) collaborate in designing new futures. Articulating and valuing these differences supports designers and communities to become partners in addressing today's challenges in the public realm.

Third, where algorithms moderate computer software's generativity hidden in a system, in community settings the moderation process is more explicitly present. For instance, although the role of the civil servant in the garden became less formal over time, she remained an active member of the community. The city of Genk acknowledged the importance of the relationships between the garden members and the civil servant. Furthermore, by taking on this more detached stance, the city showed its belief in the community's potential to become self-organised. As a strong advocate of citizen initiatives, the alderwoman for participation of the city played an essential role in the development of Betty's Garden by outlining a citywide policy to support local initiatives. In this sense, that specific political constellation created the breeding ground for Betty's Garden, as the city acknowledged its potential and believed in the added value of collaborating with DAM.

Thus, information infrastructures in community settings in the public realm should not support complete self-organisation and maintenance by communities. Framing the

process as co-organisation, in our opinion, articulates better its political character. After all, the complexity of design for the public realm requires multiple partners, beyond the community alone. When communities are receptive to it, governments and policy-makers have a role to play in creating supportive conditions for these communities to grow (Olivastri, 2017; Huybrechts, Benesch & Geib, 2018). The same goes for the designers of DAM who took on active moderating roles to set up projects and information infrastructures for the community. Although they gradually became less active in the garden, they continued to support the community in their search for funding and kept involving them in new trajectories. Furthermore, the permanent presence of DAM proved to be an essential infrastructure in the community's transition to strengthen self-organisation (or co-organisation). Not only the physical space of DAM but also the network of information infrastructures contributed to the community's process of building capabilities. A vital quality for generativity to this end is that the information infrastructures are co-designed, co-owned or even rejected and redesigned by the actors involved. The case of Betty's Garden exemplified how the volunteers self-initiated the use of DAM's space, network, documentation of attachments. Furthermore, democratic dialogues allowed the community to build capabilities in co-designing information infrastructures and integrating them within their activities.

Our observations foregrounded the importance of presence and moderation by the designers in community-based PD processes. Generativity, as a quality of design in the public realm, does not need to strive for enabling communities to operate entirely without the support of public or private institutions. Forming generativity in that way would be a denial of the political character of these infrastructuring processes taking place in the public realm. Instead, generativity needs to imply elements of co-presence

and co-moderation, but also providing space and time for communities, policy-makers and designers to adopt, appropriate, reject, invent, and integrate information infrastructures and capabilities (Volpi & Opromolla, 2017).

Conclusion

This paper aimed to contribute to a better understanding of generativity in design processes that engage with communities in the public realm. When the public concern comes into play, generativity is not limited to an information infrastructure that provides people with the necessary tools to self-organise. Taking care of the public realm requires the design of information infrastructures that support different actors to build capabilities in self-organising partnerships with close attention to the politics of this process: the power imbalances and dynamics of decision-making processes.

Designing infrastructures that support generativity in the public realm is a process wherein designers together with communities aim to form a close dynamic between co-organisation - instead of self-organisation - and building capabilities (Figure 5). This dynamic also sharpens insights about the process of generativity, which reveals itself as an interplay between designers, communities and other actors who initiate different processes through democratic dialogues. Uncovering the types of dialogues that are present in projects that engage with challenges in the public realm, supports both designers and community members to more consciously give form to these dialogues in the future that support (designing for) generativity. An interesting finding was that the developed dialogues and capabilities were fruitful, precisely in their diversity and how they conflicted, meshed with and complemented each other. This allows designers and communities to abandon the thought that they need to transfer skills from one side to another. By explicitly describing the communities' roles and

capabilities, the paper fills in a gap in the previous research on democratic dialogues, which focussed on the designers' perspective.

On the one hand, studying the dialogues initiated by the community increased our understanding of what to expect when engaging with communities. Designers, but also local governments, often transfer their expectations of "good" self-organisation to the community. The case study showed that the democratic dialogues initiated by the community were ad-hoc, action, inwards, and event-based; focussing on strengthening their community. Thus, in design processes that aim for generativity, designers should not project, but rather co-define the expectations of co-organisation with the community. On the other hand, generativity is not an automatic process initiated by designers; it is a political process that carefully develops and needs to be nurtured by different groups. Therefore, when designers co-design information infrastructures that support the self-organisation of communities, they need to take into account the infrastructures' potential to give space to the politics of co-organisation between all partners involved in taking care of the public realm.

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