Designing Collective Empowerment to Support Bottom-Up City-Making

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In this article, we discuss the role of (local) communities in city-making efforts and present a framework supporting the process of civic empowerment. This framework bridges three operational levels of empowerment, the individual, the collective, and the institutional level, with several aspects of an empowerment process. Furthermore, we introduce eight competencies that play an important role in community-based initiatives to address and take ownership of issues of mutual interest. In addition to presenting this framework and its theoretical underpinnings, we showcase two case studies that substantiate and illustrate how our framework informs design for collective empowerment. The framework enables design researchers, volunteers and practitioners, policymakers, and other stakeholders to analyze civic initiatives at different stages of development, considering the operational context and focusing on the empowerment process as it unfolds.

Keywords – Civic Empowerment, Civic Media, Human Computer Interaction, Participatory Design, Urban Games.

Relevance to Design Practice – Within design, the designer's focus is increasingly shifting from the product or service to the process of designing with a community. These developments have several implications for design practice, design research, and design education.

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Introduction

Citizen involvement has become commonplace in city-making and urban planning and has received considerable attention in the literature. Several scholars describe how bottom-up locally orchestrated efforts can contribute to the development of more sustainable and livable cities. For instance, Fassi and Manzini (2022) explicitly discuss the relationship between projects of change and sustainable community building, where urban regeneration leads to community regeneration. Also, Huybrechts et al. (2018) discuss how living labs can, in the longer term, be a key component to participation with communities. As part of a broader shift from work contexts to personal and societal contexts (Halskov & Hansen, 2015), Human Computer Interaction, and design in general, have intersected with city-making and urban planning (Foth & Turner, 2019). Designers are increasingly focusing on supporting citizens that organize themselves around matters that are important to them, creating change. This focus on societal contexts is evidenced, for example, by the rise of the term digital civics (Vlachokyriakos et al., 2016) to designate the blend of citizen efforts and digital technologies, and their role in supporting relational models of organization and civic empowerment in different application domains. It also underlines the interests in supporting sustainable interactive community technologies (Taylor et al., 2013), coupled with increased and widened societal needs (Stephanidis et al., 2019). While these digital technologies for community empowerment are widely researched (e.g., Klerks et al., 2020), a clear analysis of the concept of empowerment and its relation to design is missing.

To formulate requirements for design and establish success criteria for empowerment processes, in this article we will define eight competences from the end-user's perspective. Although in related literature several competency-based models of empowerment can be found, most contributions do not focus exclusively on civic empowerment. For example, Schneider et al. (2018) analyze empowerment through the lens of Human Computer Interaction, although leaving its design dimension underexposed. Also, Speer and Hughey (1995) address several competencies for empowerment, however, do not relate these competencies to the design of assistive technologies. Ashtari and De Lange (2019) focus on play and games for empowerment, using the MDA model from Hunicke et al. (2004), however in a more descriptive rather than a prescriptive design-based approach.

Accordingly, we feel the need for a design framework that helps to analyze and better understand past and ongoing practices in civic empowerment. Within this framework, we approach citizen participation from a collaborative design perspective, aiming to suggest designers to act as *change agents* within a local context. In this article, we shift our focus from the designer to the end user and focus on the process, where the designer is part of the team and facilitates the end user. These so-called community design processes do not necessarily coincide with existing practices of participatory design and/or co-design; although they overlap in their mechanisms, the processes may differ (Schouten

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et al., 2020). Consequently, in selecting the literature and context, we have taken a broader perspective, also including the concept of empowerment and community-driven initiatives in general (Schouten et al., 2022). Furthermore, we like to focus not only on technologies, tools, and design interventions as endpoints, but on the social processes of empowerment, as it unfolds in bottom-up citizen initiatives (Cattaneo & Chapman, 2010). The framework we present builds on existing literature as well as practice and aims to guide practitioners as well as researchers. It contributes to the emerging field of civic design by identifying, reflecting, and acting on challenges and opportunities of design for civic empowerment (DiSalvo & Le Dantec, 2017).

The main contribution of this paper is a practical model and a set of empowerment-related competencies which together guide the design for community-led citizen initiatives. A competency is the capability to apply or use a set of related knowledge, skills, and abilities required to successfully perform functions or tasks (Huybrechts et al., 2017). This paper is structured as follows: in the next section we discuss empowerment in the context of Human Computer Interaction and related domains. The line of arguments in this section prefaces the components of our model of design for civic empowerment, which is presented in the following section. After introducing the model, we illustrate how this model can be used to design for civic empowerment in existing and future citizen initiatives. In the next section we discuss our model from a practical perspective and comment on its use in two practical cases. We conclude with a recap of our findings in the final section.

This paper is the result of a long-term Dutch research project named Smart Technologies, Empowering Citizens (STEC). Partners consisted of research institutes, industrial partners, and grassroot organizations.

Empowerment in Context of HCI and Design

Empowerment is a topic of increasing interest in Human Computer Interaction and Design Research. Practitioners of Participatory Design and Co-Design have long strived to support empowerment by involving those impacted (Halskov & Hansen, 2015; Zamenopoulos & Alexiou, 2018). Zamenopoulos et al. (2019) describe how Co-Design can empower participants in four ways: power to, power over, power with, and power within. Power to refers to the ability to do something, exemplified by philosopher Hannah Arendt (1970) as *the human ability not just to act but to act in concert* and political theorist Hanna Pitkin (1973): "power is a something - anything - which makes or renders somebody able to do, capable of doing something. Power is capacity, potential, ability, or wherewithal" (p. 276). Power over refers to the relation between multiple actors where one exerts control over others, following what political scientist Robert Dahl (1957) explained as *A has power over B to the extent that he can get B to do something that B would not otherwise do.* Power with relates to the ability to work together with others to achieve, and power within describes the ability of people to mobilize their own skills and resources (Zamenopoulos et al., 2019).

The development of technology to support empowerment is reflected in the expanding body of work on Digital Civics, which describes the creation and investigation of technology to help citizen individuals become *agents of democracy* and able to reconfigure their relationships between citizens and public institutions (Vlachokyriakos et al., 2016) by tracking code violations as an act of care towards their neighborhood (Meng et al., 2019), by co-designing an open data platform that engages citizens in data science (Puussaar et al., 2018), or by involving minoritized groups in local decision-making (Johnson et al., 2018). Cazacu et al. (2020) advocate redefining and strengthening the relation between public authorities and citizens through co-creation of more ethical, personalized technologies that improve citizen participation. As an example, in Brisbane (Australia) as well as Amsterdam (the Netherlands), augmented reality (AR) provides the ability to access an extra layer of information to the citizens about the city, allowing identification, discussion, opinions on broken city furniture and urban planning, and other innovations (see Figure 1).

Also, serious games and playful interactions are increasingly situated in a context of the city and civic empowerment (Schouten et al., 2022). In the recent history, play and games are frequently implemented to support processes of empowerment (Gordon & Mihailidis, 2016; Vlachokyriakos et al., 2016). Games invite collaboration, often in a tangible way, and are able to explain difficult concepts in a fun, easy way to non-experts. In this way, they help people become more critical about complex issues and are inclusive for marginalized groups that are otherwise excluded from designing or using technology.

Gordon and Mihailides (2016) describe technologies that aid citizens to participate in public life through advocacy, activism, organization, and collaboration. They emphasize the role of Civic Media in the production and reproduction of collaborative social justice efforts. In *Design Concepts for Empowerment through Urban Play* (Ferri et al., 2018), the authors refer to playful empowerment, defining the qualities of playful interaction and player experiences within community-oriented initiatives. These efforts illustrate the increasing interest in technology and design to enable people to organize themselves and influence problems in their (local) environment (Schouten, 2016; Schouten et al., 2017).

Ben Schouten is an artist, designer, and emeritus professor at Eindhoven University of Technology and the Amsterdam University of Applied Sciences. He founded the master's in digital design in Amsterdam and until 2020 worked as its scientific director. His research focuses on play and design for social innovations, citizen empowerment, and culture. Ben Schouten develops games within the domain of health care, education, and urban planning, focusing on playful empowerment, and (co-)authored seven books and 100-plus publications at the intersection of play, games, participatory design, and citizen empowerment.

Gwen Klerks is a doctoral researcher at Eindhoven University of Technology and University of Technology Sydney. Gwen's research focusses on addressing complex socio-technical problems in local contexts in close collaboration with communities and other relevant stakeholders. She applies design thinking to empower stakeholders to share their perspectives, develop shared meaning, and participate in collective action in context. As such, Gwen supports collaboration in heterogenous groups to realize local positive change. Her PhD research focusses on the dynamics and complex design processes and the role of designers in community initiatives in urban contexts.

Silvia Cazacu is a PhD researcher at KU Leuven, Belgium. Her research focuses on tools and approaches that support critical data literacy. For example, Silvia employs data physicalization to enhance criticality in the interactions between actors within data ecosystems.

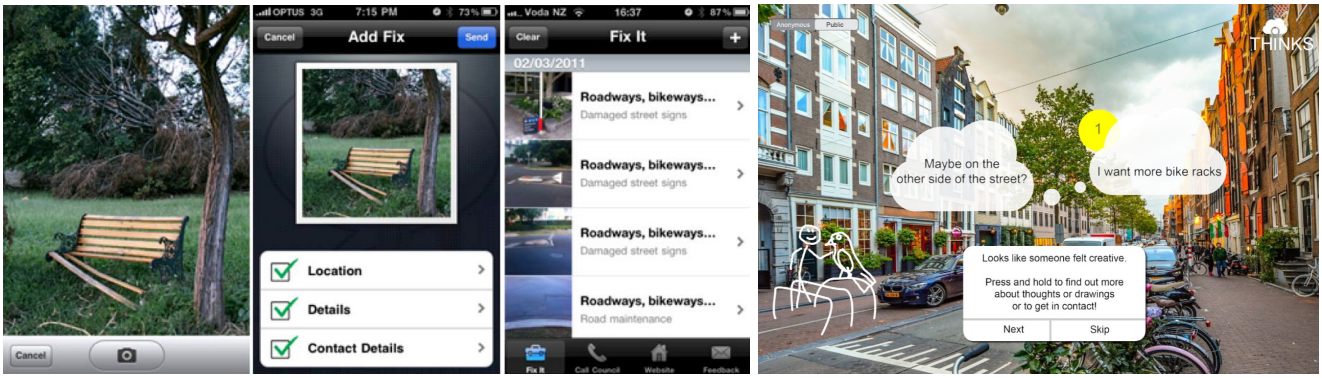

Figure 1. Two digital platforms allowing identification and discussion on (broken) **city furniture by taking photos.**
Left: Brisbane, Australia (Foth et al., 2011). Right: Amsterdam, the Netherlands (Schouten et al., 2022)**.**

Schneider et al. (2018), in their review on empowerment in HCI, distinguish eight lines of research within the technology development for empowerment, describing how technology can contribute to empowerment through developing skills and education, through creating experiences, through the design process, or through supporting community organization, amongst others. Empowerment seems to be "multifaceted in itself: it can be a process, a method, an end goal; it can be a world view, an ideology, a new paradigm, an approach to action, a symbol or a metaphor; one can empower oneself or someone else" (Schneider et al., 2018, p.1).

This wide range of practices and literature illustrates the variety of ways in which empowerment can be supported. In line with Rowlands (1995), we argue that a focus on collective empowerment can aid designers and researchers to support positive local change, and further acknowledge and challenge the practices that enable unequal distributions of power in society. As Rowlands describes in a critical review of the importance of empowerment in effective change: "The concept of (collective) empowerment, if it is used precisely and deliberately, can help focus planning, and action taking. However, when its use is careless, deliberately vague, or sloganizing, it risks becoming degraded and valueless" (p. 106). Carpini et al. (2004) as well as Bobek et al. (2009) argue that citizens can only be engaged and mobilized when they are informed and motivated, have the right abilities, skills, and resources, and can create opportunities for themselves. Cattaneo and Chapman (2010) provide an extensive review on the literature of empowerment in several application domains, such as health care, education, and governance. They underline the need to incorporate individual as well as broader social aspects within empowerment including collective prosocial interactions (Eisenberg & Mussen, 1989), defined as voluntary interactions intended to help or benefit another individual or group of individuals.

A growing body of critical work related to empowerment challenges the dominant narratives and practices surrounding technology mediated and increasingly data-driven everyday life. Researchers within critical data studies unpack the power of urban dashboards to influence a person's perception of their own city (Kitchin et al., 2016), while the governance of these urban platforms often only prioritizes administrative efficiency and economic growth rather than civic empowerment and transparency (Slobodova & Becker, 2020). From a wider perspective, global participatory platforms are shown to skew public discourse through deliberate tactics that transform social everyday interactions into a valuable commodity (Barns, 2019) while exploiting unrecognized and marginalized groups reduced to universalist and Western-dominated practices (Milan & Treré, 2019).

At an individual and community level, D'Ignazio and Klein (2023) in their book *Data Feminism* challenge the assumptions that technology and data are inherently objective and neutral, but created in socio-cultural conditions which introduce biases in the datasets used by many civic technologies. Furthermore, D'Ignazio and Klein's work emphasizes the hidden labor typically associated with data work performed by underrepresented and underprivileged identities, and proposes to embrace multiple perspectives, messy and complex perspectives that belong to people as living, feeling bodies as approach to dismantle privileged power structures currently dominating the design and governance of technology.

To better understand how to support empowerment through design and technology, we like to focus on empowerment as a process (Canning, 2007). Also, Rappaport (1985) highlights the role of empowerment to bring organizations and communities towards addressing issues of their concern. Drydyck (2013) further describes how empowerment is a process of change with a certain outcome in which well-being plays a central role. In other words, while technologies have the potential to empower people, this doesn't necessarily mean that everybody who uses the technology is automatically empowered. While we will also discuss individual empowerment, the primary focus of this article is on supporting empowerment through collective organization that enables people *working as a group to grapple with problems that the individual cannot cope with alone* (Sadan, 1997). When this is achieved, empowered people will be *better able to shape their lives for the better* (Drydyck, 2013). Accordingly, to support empowerment, technologies will need to serve a process that strengthens (local) infrastructures and culture of the people involved.

Design for Civic Empowerment

In the following paragraphs, we present our model to better understand the process of empowerment in community-driven urban initiatives. This model was developed iteratively as the main working tool of a four-year consortium initiative aimed at exploring approaches, tools, and practices that support citizen empowerment through the use of technology. The iterations were developed as part of working sessions between consortium partners from both academia, local government, and business, to better understand the interactions between individuals, collectives, and institutions at different stages of a citizens' initiative. By combining our initial observations with literature on digital civics, human computer interaction design, and participatory design, we were able to identify several aspects relevant to civic initiatives: *mobilization, organization,* and *operationalization.* Through subsequent discussions with our consortium partners led by the authors, together we analyzed the literature found and extended it with additional state-of-the-art sources that brought additional granularity through specific competences describing each of the aspects presented. We then searched for a set of competences intended to guide designers and researchers wishing to support citizens and urban communities to collectively contribute to the improvement of their living environment.

Three Aspects within the Process of Civic Empowerment

Empowerment can be considered a process by which individuals, collectives, and institutions can influence issues that affect them (Israel et al., 1994; Rappaport, 1985; Zimmerman, 1995). In our opinion, empowerment goes beyond achieving individual mastery and includes aspects of well-being and social inclusion (e.g., Drydyck, 2013). Considering the wider ecosystem in which such an initiative arises, community building seems to play a major role in this. De Waal (2021) describes various strategies in this regard about how individual citizens organize themselves into collectives. Social cohesion, community spirit, and the development of shared values seem to play an important role in tackling urban problems such as climate change, green farming, or self-housing. The community initiatives we focus on in this article are aimed at increasing impact on the environment to better meet their needs and desires.

McWhirter (1991, 1998) reflects this notion of well-being in his definition of empowerment: "the process by which people, organizations or groups who are powerless (a) become aware of the power dynamics at work in their context of life, (b) develop the skills and ability to gain some reasonable control over their lives, (c) exercise this control without violating the rights of others, and (d) support the empowerment of others in their community" (McWhirter, 1991, p.224). Zimmerman (1995) in his work describes how an intrapersonal component refers to the extent to which someone feels that he or she can influence a certain situation. As such, the empowerment process includes perceived control, self-efficacy, and perceived competence. Its interactional component includes the awareness of what (or who) is needed to work towards the set goals and the development of skills and mobilization of resources.

The work of Cattaneo and Chapman (2010) is especially relevant to the work we present here. They bring multiple theories of empowerment together in a comprehensive model of the empowerment process. They describe how empowerment is "an iterative process in which a person who lacks power sets a personally meaningful goal oriented toward increasing power, takes action toward that goal, and observes and reflects on the impact of this action, drawing on his or her evolving self-efficacy, knowledge, and competence related to the goal" (p.647). The authors distinguish three aspects of an empowerment process 1) (re)defining personally meaningful goals and objectives, 2) carrying out action towards these goals, and 3) observing and reflecting on the impact of actions. While relevant, this model however stems from psychology within the context of social justice and focuses on individual empowerment.

In our work, we focus specifically on community-driven empowerment. Moreover, we want to distinguish different aspects of the empowerment process by focusing on a set of competencies that the community (and its members) must possess to bring their initiative to fruition. As mentioned earlier, we are inspired by the growing interest in games and play used as tools to engage citizens in urban planning and city-making. These so-called urban games, as means to achieve social change, use the city as a playground to develop new ideas and collective decision-making, providing change through scenarios, role-playing, storytelling, and visualizations, amongst others (Schouten et al., 2017; De Lange, 2019). In what is called playful empowerment, three different aspects are distinguished: motivation, participation, and engagement within the empowerment process (Schouten, 2016). In several application domains such as health care and education, play and games have been instrumental to engagement and awareness for important societal issues, ranging from persuasive games to satirical games and political or critical commentaries (Bogost, 2016; Wouters et al., 2009). Given the role of communities in our approach, understanding how play can strengthen community building has contributed to our model of collective empowerment and design.

As said earlier, based on the above-mentioned research efforts, we synthesize three aspects that are important within community initiatives, framing them as activities within the process of empowerment: *mobilization, organization,* and *operationalization*. *Mobilization* refers to the activation and coming together of people around shared ideas and/or goals. *Organization* describes the efforts of shaping, defining, and organizing intended action toward the shared goal or idea. *Operationalization* includes activities related to carrying out actions that affect the shared living environment and help achieve the shared goal. Although these aspects resemble developmental stages in community initiatives, it should be noted that the process of empowerment is iterative and can move back and forth between the different stages.

A Model for Civic Empowerment

How an empowerment process may unfold at different and interconnected levels may differ and is described by multiple scholars, including the individual level (Zimmerman, 1990;

Zimmerman & Rappaport, 1988), the collective or community level (Fawcett et al., 1984; Fawcett et al., 1995), and the institutional level (Chavis & Wandersman, 1990). This multilevel concept of empowerment described by these authors links individual, organizational, and collective levels of empowerment and discusses the interrelation between these levels. In this article, we focus mainly on the collective levels of empowerment, focusing on (local) communities as an intermediate layer between the citizen and the authority—cf. De Waal et al. (2020). In this regard, Schulz et al. (1995) note that increasing power and control over individual and community events is especially important for the empowerment of individuals and groups. Without going fully into what a community is, community empowerment can be characterized as the process of gaining influence over conditions that matter to people who share neighborhoods, workplaces, experiences, or concerns (Fawcett et al., 1995).

In the previous section, we defined three different aspects of the process of empowerment. In our model we combine these different aspects with the three different levels at which empowerment manifests itself, as shown in Figure 2. The main idea of the model is that it can be used for exploring, understanding, planning, as well as designing for civic empowerment as it unfolds. An initiative might find itself positioned in certain quadrants. For example, an early-stage initiative will most likely focus on mobilizing the citizens, collective and/or institutions, while a more mature initiative finds itself alternating between organizing action and bringing plans into practice.

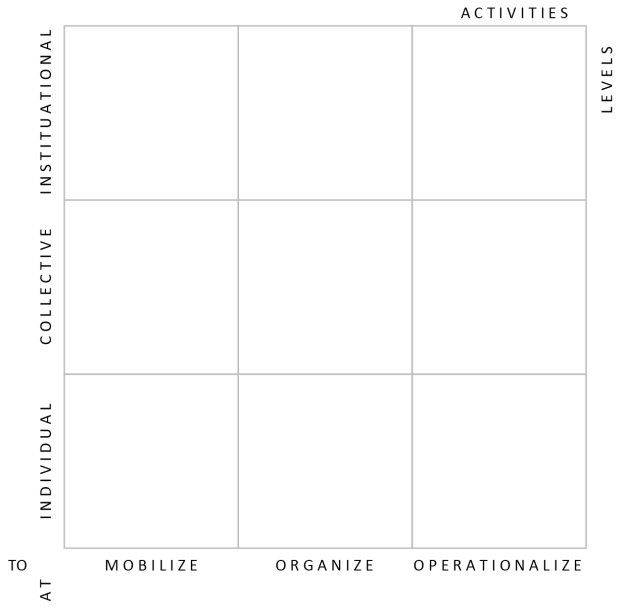

Figure 2. The model combines three different activities and three different levels of actualization within an empowerment process.

We hope to enable the designer to map each process of empowerment as a journey of putting ideas into practice and mobilizing stakeholders to create impact and future actions. Design efforts can subsequently be analyzed and targeted towards the intended level and aspect (or quadrant of the matrix).

Competencies as Design Guidelines for Civic Empowerment

So far, we discussed several aspects and levels of empowerment. To further detail the concept of empowerment so that it can be used effectively, we also identify a set of knowledge, skills, and abilities, called competencies, necessary for citizens to perform successfully in the empowerment process (Huybrechts et al., 2017). These competencies, targeted towards citizens, will allow us to formulate requirements for design in a specific context. Identifying the competency profile of an individual or group can allow designers to more effectively design tools and processes that support and empower the group. While we believe the competencies described below help operationalize the presented model of empowerment in design practice, we do not pretend that this is a complete list of success factors.

In the following section, we present eight competencies that have emerged from our research, including an examination of several empowerment projects and practices in the Netherlands, as examples (see Table 1). Three project organizers (1, 2, 5) were interviewed, and two project organizers collaborated in several workshops using our model for analyses (3, 4).

Table 1. Five projects were used to analyze a set of seven competencies as design guidelines for community driven initiatives.

1. Air Quality City Lab (City Lab for clean air, n.d.)
2. CityLab 010 (CityLab010, n.d.)
3. Play the City (PlaytheCity, n.d.)
4. Zo!City (Zo!City, n.d.)
5. De Ceuvel (De Ceuvel, n.d.)

In addition to more general and familiar competencies, such as stakeholder management, impact, and capacity building, we also focus on other and more *soft* skills needed to sustain an initiative and community, such as diversity, inclusion, and community building. The competencies have been selected as personally meaningful and power-oriented goals. These competencies can be deployed at different stages of the empowerment process and at different levels of empowerment. Analyzing an initiative using the empowerment model presented above in combination with the identification of the competency profile of the involved actors can guide designers in defining their design focus. Design interventions can both support and broaden activities across different levels and aspects by reinforcing several competencies. Below, we will introduce the eight competencies and illustrate them with some relevant community initiatives and projects.

C.1. Motivation, C.2. Diversity and Inclusion, C.3. Knowledge Exchange, C.4. Capacity Building, C.5. Community Building, C.6. Stakeholder Management, C.7. Reflection and Action, C.8. Impact & Advocacy.

C.1. Motivation. Air Quality City Lab (City Lab for clean air, n.d.) from Rotterdam, the Netherlands is an example of how technology can motivate and empower citizens to take

local action (Figure 3). Within this community initiative, a group of experts in the fields of architecture, product design, and biochemistry came together to address the alarming problem of air pollution from automobile traffic and commercial activities in the Port of Rotterdam. Motivated by their daily experiences in the affected area and driven by their own professional expertise, the experts involved citizens of the local municipality in conducting daily air measurements. By taking these measurements, residents were able to get attention from local authorities and address the problem. According to Le Dantec and Di Salvo (2013), social activity, defined as the dynamic organization of individuals and groups formed by the desire to address a problem, plays a vital role in the formation of publics or communities. Taylor et al. (2013) argue that without a clear motivation to address a specific problem, people do not join a community or lose interest in social activities during the process.

C.2. Diversity and Inclusion. In yet another project from Rotterdam, CityLab 010 (CityLab010, n.d.), the local municipality operates together with private companies and organizations to support social and local entrepreneurship. This project has a specific focus on diversity within a selection process of local companies. A jury is made up of people who live and work in the applicants' neighborhoods and stem from diverse cultural and economic backgrounds (Figure 4). In this way, the initiative ensures that the projects encompass all population groups relevant to the local community, including their opinions. The competence of diversity and inclusion is considered an influential aspect in supporting empathy and value exchange among community members, important for the success of community initiatives (Bennett et al., 2012), and can nurture a start-up project by bringing together diverse perspectives and mindsets.

C.3. Knowledge Exchange. To include many diverse opinions, Ashtari and De Lange (2019) underline how the traditional one-way knowledge flow between local government institutions and citizens has been gradually replaced by more informal community consultations and (virtual) platforms for participation with the help of urban technologies. Meng et al. (2019) refer to a cycle of local knowledge exchange, allowing citizens to have more control over the process of city-making. A good example bringing these aspects together is Play the City (PlaytheCity, n.d.), an initiative from Amsterdam (the Netherlands), with the main goal of supporting collaborative decision-making through serious games (Tan, 2014). These game-based activities are designed with the support of a canvas that visualizes layers of information about the local context, shown in Figure 6 (top). The game dynamic relies on the specific local knowledge that the players bring to the discussions. It is important that, in the process, players continuously gain insight into the specific local context and make it explicit for the players to understand who needs help, or what can contribute to helping others.

C.4. Capacity Building. The project SpeakSee aims to empower non-native speakers with the help of assistive technologies. The team of SpeakSee worked on supporting individuals from different backgrounds through language skills, designing a microphone system that translates in-person and online meetings (Figure 5).

Baibarac et al. (2019) underline the necessity of building local knowledge, practices, and experiences with the help of tools and platforms that are adequate and able to support individual and collective efforts of city-making. In general, capacity building refers to the process of improving the capacities of a person, community, or institution, strengthening their skills to act effectively on a topic of interest or influencing its outcome. By supporting specific needs and providing knowledge and skills to act upon, collectives can build capacities to address a problem in their community.

Figure 3. The team of the Air Quality City Lab during one of their citizen science meetings on air pollution in Rotterdam.

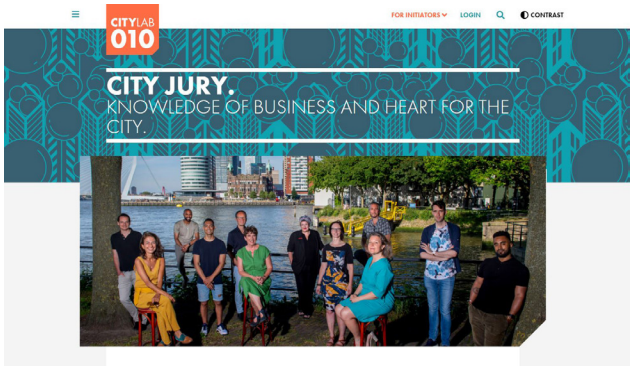

Figure 4. City jury composition reflecting the ambition of CityLab 010 to become an inclusive environment for starting social entrepreneurs.

Figure 5. SpeakSee, a social initiative supported by CityLab 010, is designing a system that helps non-native speakers by improving their understanding of the Dutch language.

C.5. Community Building. A community is clearly more than a set of capacities and not only based on efficiency but requires a mutual understanding and affinity. Klerks et al. (2020) explain how place-based urban technologies can help build communities by easing access to local resources, facilitating the understanding of collective meanings and values (Carroll & Rosson, 2013). The authors argue that participatory practices that strengthen interaction among collective identities can bring a sense of fulfillment and attachment to community members and rely on dynamics and value-based structures that are sometimes hard to understand. One of the approaches of ZO!City (n.d.), a local community initiative in Amsterdam (the Netherlands), is to use an online platform together with in-person social events to strengthen the community. ZO!City organized several events that brought the local community together in redeveloping the neighborhood, such as the creation of community gardens, illustrated in Figure 6 (bottom).

C.6. Stakeholder Management. In many cases, collective initiatives rely on a large network of stakeholders, and the success and resilience of a project is often defined by the quality of its stakeholder management. Games and playful interactions are increasingly used to help stakeholders understand each other's perspective and support them to collectively negotiate and strategize (Ashtari & De Lange, 2019; Schouten, 2016), illustrated in Figure 6 (top).

C.7. Action and Reflection. We like to refer to the iterative cycle of thinking and doing and exploring the next steps to achieve the desired changes (Schön, 1992), to underline the competency of action and reflection. This process of learning from mistakes and exploring the next steps to achieve success is illustrated by De Ceuvel (De Ceuvel, n.d.), an urban regeneration initiative that aims to reclaim a former polluted plot using clean technologies (Figure 7). The project involved a cross-disciplinary collaboration between urban planners, architects, engineers, and researchers. Together, they learned about the regeneration process by trying various technologies and strategies, such as using retrofitted boats to house new social enterprises, using plants to clean the soil, and using compost toilets and biofilters to minimize waste. Apart from the process of local value creation, the project is a success because of the tremendous inspiration it provided as a testing ground for innovative ways to reuse waste.

C.8. Advocacy. Next to experimenting with sustainable urban technologies, De Ceuvel also advocates for involving the public into the process of urban renewal through programs and activities such as workshops and lectures, but also arthouse films, music evenings, and art exhibitions. The Ceuvel is a good example of the ability to bring in external actors who can be important in the process, but also to bring coherence to communication with internal actors through ongoing engagement (DiSalvo et al., 2013). By using civic platforms that can assist with specific skills and knowledge and deal with community issues, citizens become part of the narrative, supporting the community (Asad & Le Dantec, 2017).

To bring these different competencies together, relating them to the process of empowerment, in its different stages of development at different levels, we designed a canvas around the model (Figure 8).

Figure 6. Local knowledge exchange between stakeholders. Top: Play the City, using game-based activities designed on a physical map of the local environment. Bottom: ZO!City, planting a community garden to build a stronger local community.

Figure 7. De Ceuvel continuously innovates sustainable urban redevelopment by designing new technologies (such as one that recovers nutrients from urine) **or adapting old ones to the local challenges on the ground** (such as phytoremediation–using plants to absorb soil pollutants from the area).

Figure 8. A canvas, supporting a roadmap for a community imitative, completes our model.

The model, introduced in the previous section, is the central element of this canvas, supported with various sets of design cards, representing the various competencies and exercises that support project initiators to align their vision and goals, gain clarity, and structure a plan moving forward in a workshop. Further elaboration of this canvas is however beyond the scope of this paper. For more information about the canvas, we refer the reader to Schouten et al., 2022. In the next section, we will elaborate on and illustrate the use of the empowerment model including the competencies, within two real cases. Mapping an initiative to the model can identify gaps and opportunities for design interventions supporting the development of one or more of the eight competencies.

Two Use Cases: *ZO!City and Play the City*

In this section, we illustrate how we used the model in two urban design projects in the Netherlands as part of our national research project Smart Technologies, Empowered Citizens (STEC) where local communities played a pivotal role. Applying the model in these two projects was part of a research-through-design (RtD) approach to develop the model. RtD is a methodology of scientific inquiry that uses the insights gained through a design practice to provide a better understanding of complex and future-oriented issues in the design field (Stappers & Giaccardi, 2017; Koskinen et al., 2011). In doing so, we reflected on the use and application of the model by the research team and students, and the respective outcomes to evaluate the use of the model and adjust it where necessary.

The first case, Zo!City, concerns a former business district in Amsterdam (the Netherlands), being transformed into a residential area. The other case, Play the City, involves an entirely urban district (Oosterwold) to be built in Almere (the Netherlands) that still needed to be developed. Both projects use a (digital) platform to support a local community at various stages of area development. Together with the initiators, we analyzed how respective digital platforms were used in both cases and to what extent they supported the different competencies of our model. The outcomes of the analysis were used as a starting point for additional design initiatives of several student groups. The students focused merely on strengthening the platforms with regard to certain lacking competencies, identified by the model. We illustrate how these efforts resulted into two concepts for further development of each platform.

In both case studies, citizens were involved in designing the platforms. In the case of ZO!City, it was directed by a neighborhood organization, which developed a platform with the help of local residents. In the case of Oosterwold, Play the City, an external organization was brought in to develop a master plan for the area development with all stakeholders involved.

ZO!City

As a result of the 2008 global financial crisis, many governmental investments in urban development terminated in the Netherlands. The lack of strategic funding required area developers and local communities to adapt to this situation by finding new ways of improving their conditions. Saskia Beer, an architect, started the initiative ZO!City in response. She envisioned a bottom-up, (digitally) networked way of developing Amstel III, a suburb of Amsterdam. Amstel III is a former mono-functional business district in the south-east of Amsterdam (Figure 9, left) which dealt with a high vacancy rate and low attractivity to newcomers. Through ZO!City, Beer wanted to connect various local actors

Figure 9. Left: The main goal of ZO!City is to connect institutions and citizens, taking initiatives in a local neighborhood of Amsterdam, the Netherlands. Right: A digital platform Transformcity offers citizens the opportunity to link an idea or initiative to other residents at a specific location.

and provide a space for dialogue and decision-making to identify common interests and development strategies. She started with local events such as rooftop parties, project markets, and placemaking activities, together with the residents. Over the course of several years, the project gained momentum and attracted the attention of private investors and the local municipality who also started to see the potential of creating local bottom-up collectives.

As the initiative developed, it became increasingly dependent on Beer's efforts as an intermediary, a position that left it vulnerable once its activities became too large to manage alone. In response to these challenges, ZO!City developed a virtual platform where people could share their interests and initiatives, connect with others, and find the latest news and events in the neighborhood.

This platform is called *Transformcity.* Based on a map of the local area (Figure 9, right), local stakeholders can share their project (idea) on the map and connect with other projects of their interest. For example, if a property owner has vacant office space, he can offer it to a local yoga teacher for classes. Furthermore, the platform acts as a repository of relevant news and information to spark initiatives and collaborations. The platform lowers barriers to creating new initiatives and taking advantage of local opportunities by offering various ways to connect with like-minded people.

Together with Saskia Beer, we analyzed the digital platform. The platform successfully enables stakeholders to explore local initiatives nearby and provides local news updates such as funding opportunities and network building through events and matching profiles.

Transformcity is able to connect the individual level to the institutional level by mobilizing and organizing citizens and institutions (Figure 10). Next to that, we identified three competencies that were characteristic of this community: motivation, knowledge exchange, and stakeholder management. Along with Beer's years of experience in the area, the platform was very successful, connecting activities at the institutional level, such as the municipality and business owners, with the individual level of residents and local businesses.

The platform seems ideally suited to bring citizens together and performs at connecting like-minded people, but did not directly contribute to diversity within the community. Further support proved necessary as people connecting through the platform also struggled to maintain momentum in their initiatives. Partly because of the analysis with the model, our students designed a concept called *Treasure Hunts* to pay attention to two other competencies: community building and diversity & inclusion. ZO!City's online platform and website offered a lot of information about the area, so-called hidden gems, and the students brought these *treasures* from the online platform to the *street. Treasure Hunts* are walking trails through the neighborhood, using augmented reality on cell phones and special sidewalk tiles (Figure 11).

Each of the tiles contained information about neighborhood projects taking place in the immediate area. Walking tours were then organized to initiate conversations among residents. This led to several stories, ranging from success stories and future developments to discussing challenges within the neighborhood. The goal was to inspire people to take a more active role and connect the online platform to the physical world. Stories on the platform were reported extensively and potentially made citizens more aware of what was happening and how they could contribute to it. Through the links on the tiles, citizens could participate in a project and become a *maker* of their neighborhood.

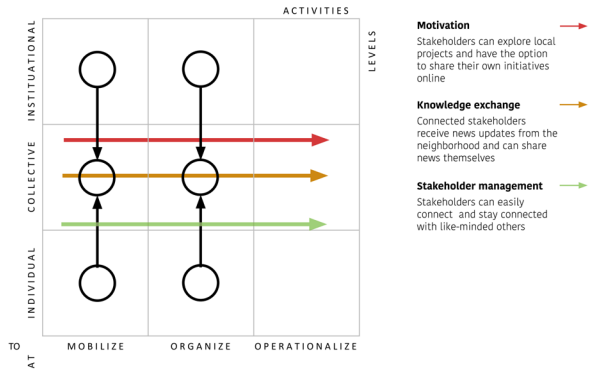

Figure 10. The ZO!City platform as analyzed with the Civic Empowerment Model. Main activities supported by the platform cover the aspects of mobilization and organization.

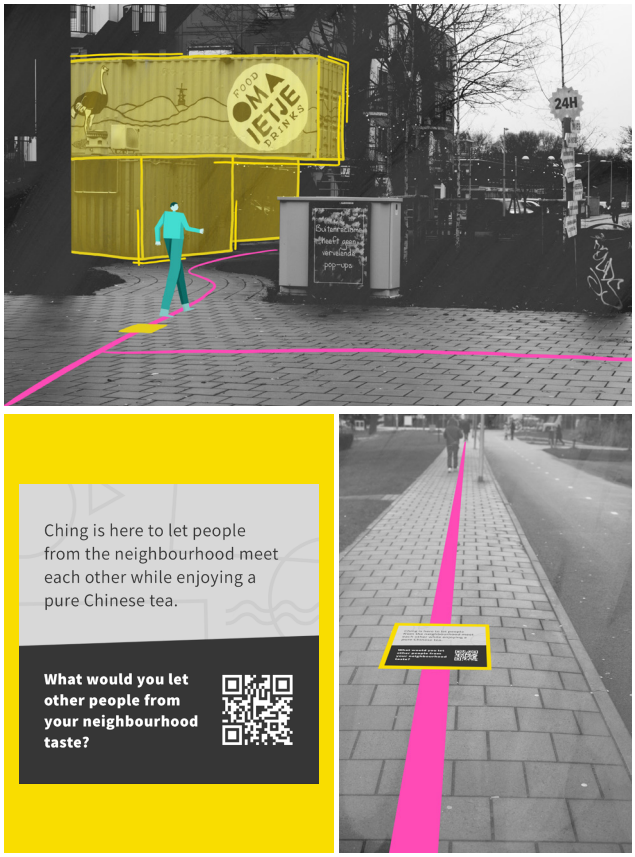

Figure 11. Treasure Hunts. To start conversations and stories on the (further) development of the neighborhood, walking tours were organized by students, with help of augmented reality. (Design: Danique de Bies, Jasper Bunschoten, Richard Lundquist)

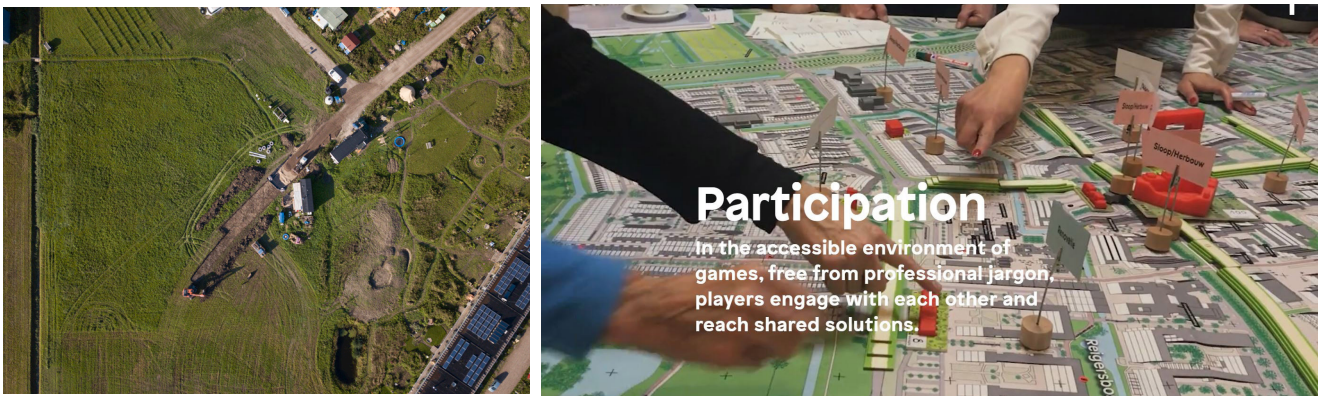

Figure 12. Left: Oosterwold, a green, agricultural area near Almere (the Netherlands) with leased plots without facilities, to build a neighborhood that is as sustainable, ecological, and self-sufficient as possible. Right: Urban Games like Play the City support decision-making by artifacts and a canvas that enable to discuss different scenarios.

Play the City

Play the City (PtC) is an Amsterdam-based studio that develops strategies and support for activities between stakeholders in urban development through personalized game-based tools. PtC tailors games to the specific context and problem using a general concept. PtC provides a tabletop role-playing game where players assume the role of stakeholders. Game elements are directly related to the problem space, such as a map of the area, and elements representing infrastructure, such as houses, waterways, and facilities. These are used in different scenarios to address the solution to a specific problem. By offering a simplified version, in the form of a role-playing game, of the problems that may arise during the development process, stakeholders, experts, and non-experts try to build mutual understanding and agree on possible actions for the neighborhood in question. Game elements incorporate reliable data through attractive and accessible visualizations. Fast-paced and competitive, the game encourages players to think carefully to make informed choices, break through entrenched problems, and test future scenarios. Play the City's games have been played in various locations worldwide and cover topics such as sustainable development, circular economy, and community development. Each game session proves to strengthen the community, exchange knowledge, and advocate for initiative among players and bystanders, as well as a collective understanding of urban planning in general.

From the portfolio of Play the City, we selected Play Oosterwold, an urban game aimed at a group of future residents of Oosterwold, a former greenfield near Almere that residents are transforming into a sustainable residential neighborhood in collaboration with local government and institutions. Oosterwold offers leased lots without amenities for future residents to build the most sustainable, ecological, and self-sufficient neighborhood possible. As a result, the entire settlement and community emerge organically from distributing public space, including its infrastructure. Play Oosterwold is intended to facilitate conversations between stakeholders at institutional and community levels about the layout of the public space and the zoning plan. In this case, the game elements represented buildings, roads, facilities for energy production, water provision, and sewage systems. The players included local authorities, planning and design offices involved in the realization of the plan, such as the MVRDV architectural firm, and other interested city authorities of surrounding municipalities, as well as civil servants from both local and national institutions.

The game sessions provided a venue for integrated thinking, where clean technologies and urban development come together. It was designed to engage actives at both institutional and domestic levels, motivating collective action. The game facilitates the competence of (cooperative) stakeholder management and innovation in various ways. The platform enables institutions, such as the city government, to participate and discuss legal frameworks, helping market parties to weigh up investment risks, and raises citizens' awareness on the sustainability of their project. Play Oosterwold addresses all stakeholder levels: individuals, community representatives, and institutional partners (Figure 13). Through role play and open invitations to all stakeholders, a specific focus within the game is on the competency of stakeholder management. Furthermore, the game, which usually lasts half a day, supports the competencies of diversity & inclusion, knowledge exchange, stakeholder management, reflection & action, and impact & advocacy mainly by allowing participants to step outside of their normal comfort zone and think freely about actions, imagining alternative futures for wicked problems such as water management.

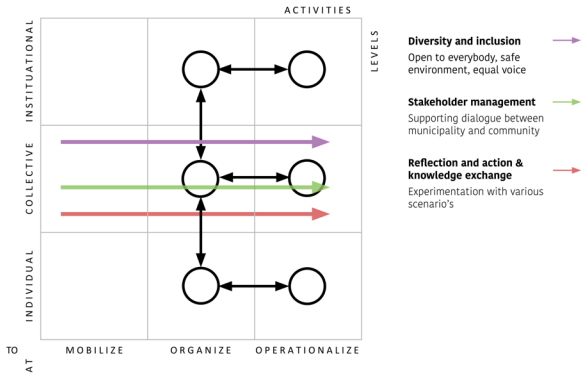

Figure 13. Play Oosterwold.
Main activities supported by the urban game cover the aspects of organization and operationalization of civic empowerment.

Lastly, the game triggers the players to engage in an iterative cycle of action taking and reflecting. Game materials introduce sourced data through attractive and accessible visualizations. The game is fast-paced and competitive, encouraging players to think on their feet to make informed choices, work through entrenched problems, and test future scenarios. Many participants appreciated how Play Oosterwold facilitated engagement and discussion among various stakeholders, including the compromises that allowed for the creation of possible plans. However, it proved difficult to secure the design principles of the local community as a whole, in the long run. Moreover, once the game was over, the city council was not always willing to incorporate the results into their longer-term plans. The model partially reflects this by the lack of integrated activities within the operational aspect (Figure 13).

The collective could benefit from strengthening the competence of impact and advocacy. Although the half-day game sessions provided a lot of information, it was generally felt that the game provided insights but failed to aggregate these insights into a consolidated plan, due to the conversational nature of the games and the lack of ability to store data and embed the results.

In our design sessions, we focused on improving the generalizability of the results across sessions and improving the competence of knowledge sharing between game sessions. With this in mind, Play the City together with some of our students started a supporting project named *Network of Games* (n.d.), to learn from previous experiences and (digitally) store knowledge and insights for new initiatives to come (Figure 14). The goal was to design interventions that would support stakeholders in the competency of knowledge exchange and in the competency of impact and advocacy by learning from other projects. Learning from other projects would help the stakeholders to adopt, adapt, and implement insights in their own projects. Play the City wanted to set up a digital interconnected framework where several existing urban games can be integrated.

Games generate both quantitative and qualitative data that is manageable and meaningful for communities and policy makers. They are often focused on a specific theme or subject, but the results and generated data from a game can in turn also form interesting input for other contexts. By bringing together multiple games and datasets, game options are expanded, and they can be used better in the debate about complex urban challenges. By linking individual games, insight is created in how cities learn, plan, and decide. It facilitates a more detailed and realistic reflection on the future scenarios for urban planning. For instance, new construction in the Netherlands is highly dependent on nitrogen emissions and nature conservation. An integral view is needed and can be maintained through this network of games.

Discussion

In this article, we have focused on design for citizen empowerment from the perspective of the (local) community. Thus, within our design efforts, we have focused on facilitating community activities and driving the empowerment process rather than on products and services as endpoints of design. We defined eight competencies focused on the skills and abilities of the empoweree. We noticed that, since many projects within civic empowerment are unique, they need special strategies and specific interventions to succeed. The model we designed to support this journey includes different stages of the empowerment process that unfold at different organizational levels, depending on the stage of the empowerment process. In this section, we discuss what we think the model, including the competencies, could contribute to our design community.

When discussing competencies separately, it became clear to us that, in many cases, digital tools and platforms are not sufficient to support sustainable community building and need to be complemented by offline events, such as (social) activities, entertainment, and collective information gathering, to develop a sense of community and belonging. Many collective activities focus on capacity building which does not always go hand in hand with community building. The cases of Play Oosterwold (Play the City) and Transformcity (ZO!City) showed us another interesting insight. To improve civic design and build a strong community, there is a need for shared views, the articulation of underlying

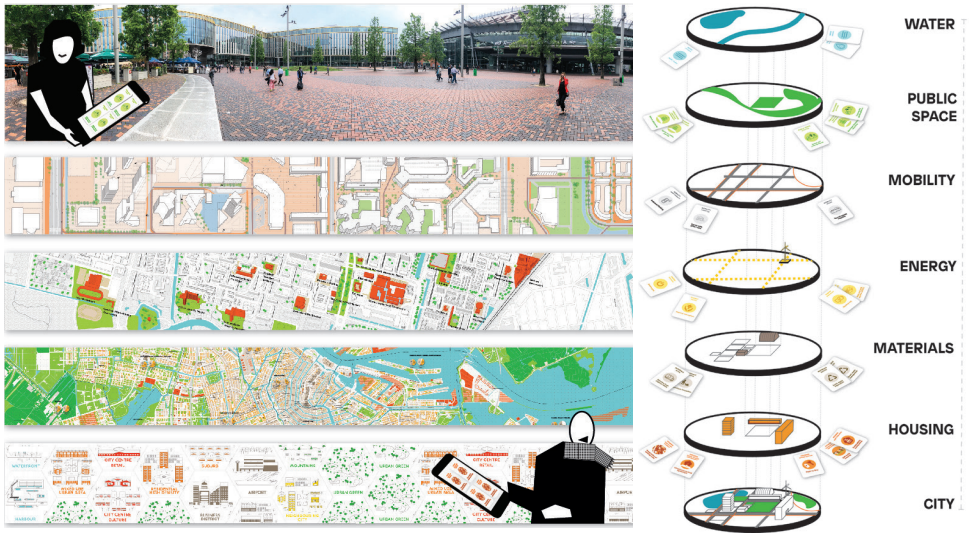

Figure 14. Network of Games, a platform where individual games can be linked to one another. This ecology of games supports complex city making through data collected from different Play the City sessions.

values, and ownership. In such cases, speculative designs for alternative futures such as games, storytelling, and visualizations are highly desirable functionalities.

Many of the civic tech, such as (digital) platforms, we examined are incapable of keeping a community discussion sustainable and interesting, let alone resistant to the changing zeitgeist. This results in decisions or scenarios that cannot be understood or applied in changing contexts. This was especially apparent at the time of the COVID pandemic, a topic we are currently investigating further. Desired functionalities viewed from a social standpoint clearly go beyond the efficiency of "supply and demand." It needs citizens to discuss and share values and rituals that create a common language of understanding. Over the years, we have analyzed many community initiatives that show a broader spectrum of activities, focusing on competencies, such as inclusion and diversity, reflection, and community building, that contribute to mutual understanding, empathy, and a *common language*. By supporting the design of these broader competencies, these initiatives last longer.

When we zoom out to get an integrated view, relating the competencies to the different stages of the empowerment process, we observe an emphasis on the organizational stages in community-led initiatives. There is less focus on the aspects of operationalization such as advocacy. This is in line with related research (Teli et al., 2,020; Huybrechts et al., 2017) on institutioning; institutioning is defined as the engagement with (existing) institutions. Authorities, while in many cases wanting to promote citizen participation, seem less interested in putting words into action, providing the necessary structures. Motivation and social activity, knowledge exchange, and inclusion also seem to be less of a priority in many of the initiatives we examined. We hypothesize that this happens because the mobilization aspects of community initiatives are often overlooked when the goal is clear from the beginning of the project. In that case, each member usually already comes with high motivation and personal knowledge to contribute and does not need to be reinforced beforehand.

Another thing worth noting after analyzing the online (and offline) activities of community-based initiatives is that the group of people usually most active and visible in these projects is small, and in many cases from the same ethnic, cultural, and socio-economic background. Often, too little emphasis is placed on strengthening inclusion and diversity, an asset easily accessible to bottom-up projects compared to top-down institutions and private companies. Strengthening a more diverse community that appreciates what makes them different, in terms of age, gender, or ethnicity, is not always a key priority, especially in the long run. Maintaining the cohesion of a community is not always a high priority compared to the goals the community wants to achieve.

In general, we could see that of the initiatives we examined (see Table 1), those that managed to implement the widest range of competencies were the most successful and sustainable. That, in this article, we treated the relatively new topic of citizen empowerment at the intersection of citizen media, activism design, and citizen participation may have painted a somewhat rosy picture of the possibilities of design for empowerment to support citizens in doing so.

We primarily focused our analysis in this article on how assistive technologies are intended to support empowerment. We do not, however, believe in naive *solution thinking* (Morozov, 2013) in which the possibilities of digital media and technologies (whether or not combined with playful approaches) automatically empower citizens (Schouten, 2016). We are aware of the potential pitfalls of the emergence of new media platforms and other civic technologies as analyzed in our cases. One is the user perspective, to what extent are citizens competent enough to use these tools (Gillmor, 2010; Rheingold, 2014)? Furthermore, it is not only about user competence but also about what goals these tools really pursue and how social values are reflected in them. We could argue that these new digital (play) opportunities, pre-programmed into the media we use, uniformly prepare us to do the "right" thing. It is important to design for more open interpretations that bring together a wide range of different opinions and viewpoints.

The artefacts designed in the process are clearly not neutral and imply specific configurations of subjects, objects, practices, and power structures. In many cases, the institutions involved also lack a long-term vision and strategy for participatory urban development. It became clear to us that institutions must also be prepared to facilitate bottom-up processes.

Conclusion

To bring greater granularity to design guidelines and clarity to concepts and nomenclature around empowerment, we proposed a framework for collective citizen empowerment. We aimed for a conceptual framework that can be used both descriptively and prescriptively to support design decisions for community-based city-making initiatives. The model combines three levels of empowerment (individual, collective, and institutional) with three aspects in the empowerment process (mobilization, organization, and operationalization) and includes a set of competencies which can act as guidelines in this designs supporting civic empowerment.

We showed how digital technologies and civic media can help create an inclusive space for exploration, awareness, and knowledge exchange, where citizens can gradually develop competencies for taking co-ownership of their city and as such empower citizens through various competencies. We illustrated our work by presenting two projects in which design interventions were created to support specific competencies. Using the framework to analyze the initiatives allowed us to come up with interventions which fitted the specific empowerment processes at play.

From the illustrative examples, we see that civic participation is more successful when processes, tools, and technologies are aligned to support both the practical side of community initiatives and the softer, community-building side that supports cohesion and social cultural meaning. This has changed the role of the designer. In the case of participatory city-making, the collective intermediate level has become the working area for the designer. We believe that future designs should address and serve this intermediate level of communities by responding to the values, rituals, and organizational structure of the collectives. We invite other researchers and practitioners to test this model with examples of projects from their own practice and contribute to its

enrichment with new perspectives or to consider this model in the process of policy making, strategy, and other plans to promote the empowerment of citizens.

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