Neighbourhood Data: Exploring the Role of Open Data in Locally Devolved Policymaking Processes

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There is a growing public, political, and academic discourse around the idea that data has the potential to empower citizens. In particular, evidence-based policymaking is at the centre of national and regional planning processes. At the same time a shift towards Localism in planning means that while citizens and civic groups are centrally involved in decision-making about their communities, they lack the skills, resources and access to data that might inform their decision-making. This paper explores the need to establish new ways of supporting deliberation and decision-making in local planning. We report a study that explores the role of data in the complex processes involved in consultation events and the broader collaborative processes surrounding them. In doing so we highlight the need for the integration of dialogic forms of participation with other locally produced data, and for this to be shared in ways that position data as a resource for action.

CCS Concepts: • **Human-centered computing → Human computer interaction (HCI)**; *Empirical studies in HCI*; Empirical studies in collaborative and social computing;

Keywords: Civic Technology, Data, Decision-Making, Policymaking, Neighbourhood Data

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1 INTRODUCTION

There is a growing public[1], political[2], and academic discourse promoting the idea that data have the potential to empower citizens [4, 62, 75], and in the UK, there is a strong emphasis on the use of data to inform policymaking processes. In particular, evidence-based policymaking is at the centre of national and regional urban planning processes. However, new policy devices legislated through the Localism Act (2011) [15] have caused a shift through which ordinary citizens are increasingly taking on the role of policy-maker in their local communities.

Neighbourhood Planning [15] is the flagship of these new policy devices, ostensibly designed to devolve power away from central and local government directly to citizens, allowing them, for

[1] https://www.theguardian.com/media-network/2016/aug/19/apps-for-democracy-open-data-and-the-future-of-politics
[2] https://www.gov.uk/government/news/new-support-for-tech-to-boost-public-sector-productivity

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example, to write their own statutory planning policy [29]. Despite the promise of democratic renewal this brings, it raises a number of challenges for civil society organisations and individual actors as they assume new roles in new structures of governance and decision-making frameworks. Increasingly, civil society actors are instituted into a position of responsibility without the means to fulfil their new role, specifically but not exclusively in terms of access to relevant data.

Despite scientific and quantitative knowledge being accused of offering *"limited potential for improving the evidence base of policy development"* [63] it is widely privileged in policymaking. The planning system, even since the Neighbourhood Planning Bill [15, 16], has remained largely unchanged, leaving those who work within planning to call for processes that encourage greater citizen deliberation over issues [5, 69]. It is argued that policymaking is better understood as *"a process of deliberation which weighs beliefs, principles, and actions under conditions of multiple frames for the interpretation and evaluation of the world"* [20]. This echoes the position of political science scholars who call for more 'deliberative' and dialogue-based processes [27, 36, 50].

These issues and concerns led us to our research questions and guided our investigation into new ways to support such processes. As such, we identified a need to better understand (i) the challenges faced by civil society organisations involved in devolved decision-making; (ii) the role national statistics data (e.g. Deprivation Index), local data collected by civic groups through (e.g. surveys and opinion polls) and media, plays in these processes; and, (iii) the ways in which theories and methods of more dialogic forms of engagement, such as deliberative democracy, can be used to facilitate these processes of policymaking.

In this paper, we explore 'data' as a "resource for action" [68] at a community level in the context of Neighbourhood Planning. To investigate the practices of a community in relation to 'data' and explore the challenges, opportunities and limitations of constructing 'neighbourhood data' as a legitimate local policymaking resource, we use observations, workshops, and interviews. Through reporting on this research, we contribute to CSCW research by bringing into focus the complex collaborative processes around a consultation event and beyond, and the role data play in those processes. We present this in three ways: (i) through an analysis of interview transcripts, we offer insights on the discussion around the role of data in complex but increasingly commonplace political processes at the civil society level; (ii) we present findings from a series of workshops, in which citizens used data as part of deliberation in the context of local consultation; and (iii) we provide design principles for data-driven civic technologies based on an intersection of our experiences of practice and democratic theory. These principles emphasise a need to develop a more value-sensitive understanding of the kinds of *actions* that are *resourced* through data, and the need for design that supports communities to understand their own issues, rather than to simply gather evidence.

2 BACKGROUND

In this section, in order to give context to the study, we discuss related work, before outlining the implications of localism legislation for community organisations and citizens involved in neighbourhood planning. We also raise questions associated with introducing dialogic forms of data as a new dataset in this setting, highlighting the benefits of democratic deliberation in local consultation and decision-making processes as well as barriers to making it meaningful in processes that rely heavily on official statistics in so-called data-driven policy design.

2.1 Civically Engaged Technology Design

Within experimental and design fields such as HCI and CSCW, the area of civic technology can be seen as an *"area of study loosely defined as the design and use of technology to support both formal and*

informal aspects of government and public services" [9, p2970]. It is defined elsewhere as 'civically engaged' technology design [7], digital civics research [3, 58], and a 'civic turn' [41].

The focus of our digital civics research is around the potential value of structured (data) games and interactions to support civic deliberation and consultation around local-level urban planning. There are several examples of structured games for consultation, both online and offline. Despite varying in context, effectiveness, and purpose, all share common characteristics, and a common genealogy. There is a long tradition in participatory design research and co-design around participatory games as a means of engaging citizens and facilitating collaboration [11, 26], and this approach is common in civil society contexts, such as urban planning consultation [61]. In *Participation Design Things*, Ehn [22] explains that *"democracy and skill as guiding values for participatory design lead to an interest in legitimate participation as well as possibilities for users to express and communicate 'tacit knowledge' and 'aesthetic experience'."* These values are epitomised by Schuler's re-framing of the normative ideals of deliberative democracy into a set of challenges for interaction designers [64]. Schuler first sets out how deliberative forms of democracy are vital to the future, and how technology and interaction design are vital to achieving deliberative democracy.

In *Planning with Crowdsourced Data* the authors identify the role data collected by cyclists using a purpose built mobile application played at an urban planning event. In the reporting of the study the authors suggest that data be viewed *"not as a means of fact-collection, but a space for discourse, discussion, and argumentation."* [47, p1726]. This of course, creates an additional layer of challenge for public officials related to sense-making and translation. These challenges are further explored and investigated in the *Community Conversational* study on how to integrate dialogue captured at consultation events for neighbourhood-level planning into a tool for decision-makers [40]. Despite being successful in facilitating dialogue, this lacked a meaningful influence on the policy processes due to a lack of information that was perceived as 'evidence'. Another example of civic technology to structure dialogue is *@stake* [35], a 'serious game' designed to build deliberative capacity through role-play and facilitate more deliberative interactions in consultations associated with Participatory Budgeting exercises. In addition, serious game design has been implemented with a focus on data access and sense-making. *Datascape* [75] is a game designed to support citizens to better understand the relationship between data, and the environment from which it is derived. Through a board game prototype, the authors explore the idea of using a map as a filter for open data sources, enabling users to access data by location. In the prototype of the game developed for the *Datascape* study, participants were asked to choose where they would like data to be collected based on a perception of 'missing' data. The work is motivated by a hypothesis that the public fail to recognize the utility of available data. In another investigation into this issue, the authors of *Storytelling with Data* led calls to support relationships and facilitate communication between civil society groups and experts in data science [25]. Short of designing game mechanics, a number of studies focus on making engagement with data more interactive. These include *VoxBox*, [34] in which participants submit responses to traditional questionnaire prompts in a tangible interface and similarly the *Sens-us* project [33] in which submitting traditional responses to the UK Census questionnaire was made physical and fun.

Civically engaged technology design researchers in this space are asking questions about the role of data and the relationship between data, action, and knowledge. Gaver *et al* have developed devices and a study to invoke curiosity around big data and space with *Datacatcher* [32], whereas the *Data-in-Place* study [49, 70] looked to investigate the meaningfulness and contextual significance of data with a combination of digital technologies in residents' homes and in shared spaces on one street. Other research in CSCW-related fields has focused on the role of technologies in the hands of citizens and civic authorities, including studies into how citizens use technology to participate in local governance and influence their socio-political experiences [24]. Researchers in

this space have more recently explored the idea of a 'data commons', for example Balestrini *et al* [6] investigated a shared resource for citizen-generated data to tackle issues of damp housing in a UK city. Digital civics research of the type reviewed here is increasingly interested in and characterised by collaboration with civil society, defined here as community organisations, resident associations, NPOs and charities working with communities.

2.2 Localism and Civil Society

In the UK, the context in which this study took place, civil society groups are commonly bestowed powers and responsibilities in new structures of governance brought about by a mixture of localist politics and austerity. Under these new structures of governance, increasingly ordinary citizens are taking the role of the bureaucrat in localism initiatives, changing the nature of political representation [44]. Many scholars and commentators championed the Localism Act (2011) as a way to give citizens the strong engagement with local authorities that had been missing [42, 67]. However, reductions in spending and staffing, and an increased focus on devolved powers to citizens instead created a "political parallel" [65] for local council leaders. In reality, without resources to support local communities, local authorities have experienced a "double devolution" [45, 56] where the relationships between the state, the citizenry and local councils has changed in a profound way. Local civic authorities have become increasingly reliant on civil society and the voluntary sector. As such, the Localism Act (2011) presents what appears to be an opportunity to 'empower' communities and citizens, but in practice acts as a way of relieving civic authorities of unsustainable costs. Communities, social innovation organisations, civil society groups and the citizenry are left to 'do it for themselves' in the absence of expected local authority support. Moreover, ordinary citizens in new positions of responsibility in such initiatives do not have the same reasonable access to data sources, or the ability to use data in their consultation or policymaking processes, despite an expectation that data is presented in policy documents as a pre-requisite of adoption by the local planning authority [16, 17]. Furthermore, prior work has highlighted that civil society groups privileged and prioritised *evidence of* consultation, rather than *evidence for* policymaking [40].

2.3 Deliberation and Legitimacy

Similar to the participatory design tradition that states those affected by a design should have a say in its process [22], deliberative democracy insists that those who are affected by a decision should have a say in the decision-making process [57]. Beyond broader ideological claims of deliberative democracy, citizen deliberation – distinguished from other forms of deliberation by the motivation to include ordinary citizens – is argued to have a positive impact on the attitudes and behaviors of citizens who participate, including greater civic efficacy, and ability to be more reflective on issues [28, 30, 36] (see Table 1). It is also argued that deliberation is a method for "future visioning" [60]. However, among other criticisms, most deliberative events involving citizens struggle to be noticed and taken seriously by relevant decision-making authorities or policy-makers (see [39, 54]). This is often related to issues of transmission between informal discursive arenas and formal decision-making arenas [10, 39, 55].

As Hakken [37] warns, the presumptions we have about knowledge have now become embodied in economic policies and social programs, which for us opens questions about 'datafication' [53] where the collection of statistics about citizens is framed as 'knowledge' for creating policies that affect people's lives. Here we explore how data can be used as a "resource for action" [68] during citizen deliberation, both to add an epistemic function during deliberative processes, and as a form of evidence for policymaking by creating the basis of 'legitimate' evidence for the civil society groups to use in their devolved policymaking processes.

Table 1. Reasons for Discursive Democratic Engagement

Inform policy	Identifying the public's values and concerns helps policy-makers. When problems are close to citizens, they can give their own insights and then "offer critical pieces of the puzzle"
Legitimise policy	When citizens engage authentically in decision-making, it is easier to legitimise outcomes
Free up policy process	Citizen participation can help loosen political deadlocks
Help citizens move toward "public judgment" on issues	With deliberation citizens can mature their opinions about issues. Recognition of political manipulation is more frequent
Promote a healthier democratic culture and more capable citizenry	Deliberative public engagement helps democratic culture and practice. It provides new methods for democratic action
Build community	With public deliberation it is possible to build stronger communities
Catalyse civic action	Deliberation facilitates civic action. Deliberation creates more active citizens

Source: Friedman 2006 pp17-19.

We ask what data are relevant, and what is the relevance of data to people's lives? In conceptualizing 'neighbourhood data' we bring forward an ontological position, following Taylor *et al* [70] and Wegner [73] that understands data as subjective and bound up in particular contexts, situations, socio-material and temporal worlds, something that is incomplete, potentially enriching, and potentially misleading. In the following section, we discuss a study wherein we considered the relationships between data and people, by investigating the potential uses of open data for citizen participation during the early stages of a neighbourhood planning consultation process. We were interested in the relevance of data to people in representing matters of local concern. In doing so we investigate the role of data, and how they might be used in more creative and value-sensitive ways within wider participatory civic processes.

3 STUDY DESIGN

The study takes shape across three activities. The first activity involved a process of understanding the key stakeholder community members and residents through the construction of an ethnography informed by informal interviews, participant-observations at community events, and official meetings for the Neighbourhood Plan. The second activity involved running citizen mapping workshops, where a paper prototype version of *Community Conversational* [40] was modified to include graphs and tables representing data for different areas of the town. The third activity consisted of semi-structured interviews with ten civil society group actors involved in the community. The interviewees represented the largest three local civil society organisations that focus their work in the community with roles in the organisation ranging from chief executives to front-line staff. We also interviewed an employee of the local authority, involved in community engagement in the area, and an elected local councillor who worked closely with the community and civil society organisations.

In the following sections, we first provide details from each part of the study, then present a findings section in which we discuss our thematic analysis of the interview data from the interviews carried out, as outlined in section 3.3. This precedes a discussion section wherein we present our concluding remarks concerning the wider collaborative implications when bringing together locally relevant data and traditional consultation processes with public bodies to support devolved local decision-making.

3.1 Activity 1 - Understanding the Community

The study is part of a long-term engagement with the community, to understand how technology design might support discussion between people, and how it might capture experiences, ideas, concerns and questions about how neighbourhoods may be designed and planned differently in the future. The first phase of our collaboration with the community began 12 months before Activity 2 and coincided with the initial stages of the Neighbourhood Plan process. Over the course of that year, we worked with local authority actors, several community actors, and civil society groups on various projects and events in the area to get a better understanding of the place and the people living there.

Following this there was a period of six-months during which the research team took the role of participant-observer in a series of meetings organised by the civil society groups. These were held with with residents who were interested in becoming part of the Neighbourhood Plan working group, to explore how they could use the Neighbourhood Plan to bring about change to improve the community. These meetings resulted in the creation of five themes (e.g., housing, employment, etc.), which could act as areas of focus for the beginnings of putting together a local planning policy document. Despite some interest, the attendance at these meetings was often disappointing, and a concern that not only were the same small group of residents attending, but also within that group some people had a dominant influence on discussions. Regular meetings and discussions with the community leaders who were driving the process forward resulted in the decision that in order to support the democratic processes of the neighbourhood plan, there was need for a wider engagement with the community. We were asked to design and run some engagement workshops with residents to explore how to address these issues and engage the wider community. The groups had carried out several consultations in the past, using traditional methods, such as town hall meetings, questionnaires, and posting leaflets through residents' doors, but they asked us to use our experience as interaction design methods researchers to run some workshop activities that would engage residents in a structured dialogue.

3.2 Activity 2 - Designing a Consultation Process

The research team consulted a series of existing tools and design workshop activities before deciding on deploying an adopted version of the *Community Conversational* platform discussed in section 2.1 of this paper. This particular platform was successfully used to structure conversation and provide a level playing field that offered equal opportunities for all participants to have their voices heard. Importantly, it was a place-based table-top design that could work on any map meaning we could create a map of the area for the neighbourhood plan and use the other components 'off-the-shelf'. However, as pointed out in section 2.1, the original board game did not utilise community data, therefore in order to work within the context and aims of this study, the platform had to be re-designed to include a 'data' element. Building on the original platform which was designed to structure and capture conversations about people's experiences of living in a specific neighbourhood, we integrated a layer of data to it using open-source datasets from governmental institutions (i.e. Home Office, Office of National Statistics). This was presented to participants as simple tables, graphs and graphics embedded as a layer into the map that formed the board for the

board game. The map data was based on the five priority areas for the area, as identified during the initial community meetings with residents (i.e., housing, transport, employment, health, anti-social behavior and crime).

The first step in designing this was the creation of a paper prototype design that involved printing out the graphs onto a layer of A0 paper, and cutting out flaps on the map so participants could lift the flap to reveal the information in the relevant geographic area of the town [see fig. 1].

Fig. 1. The paper map and 'data layer' used in the mapping workshops.

Our collaborators provided the venue for the workshops and invited residents to them through their social networks. Our role was to explain the activity once residents arrived and provide a report to the civil society groups involved in the planning process, on what information we captured during the workshops. We first ran two pilot studies with each of the groups in their community buildings, before holding the main workshop in one of the buildings. The workshop was held on the same day as a community event at the building around safe communities and residents were able to sign up before or on the day. Despite only three people signing up beforehand, we ran a workshop including 12 residents across two tables. The workshop lasted one hour, including instructions at the start. We recorded the audio of the discussion on each table as well as using a video camera to record where the markers were moved during the activity. Throughout these activities we carried out observations and spoke to many volunteers and residents we recorded in fieldwork diaries.

Residents took part in the activity and looked at the data presented on the map. However, their interaction and discussion around the data revealed a distance from what was represented: for example, the granularity of the data was an issue where one area was shown to have high levels of anti-social behavior, but residents claimed this was a more specific area, and felt this showed the wider area in an unfair light (see section 4). As reported in previous studies (e.g.[3, 25, 75]), the most interesting discussion came from storytelling and participants' personal reflections and opinions.

Our collaborating civil society actors observed the mapping workshops, or in some cases took part as residents, where we asked them to take the role of 'community member' rather than 'community leader'. After the workshops we interviewed the civil society actors who had collaborated on the workshops with us, those present at the workshops, and some other community leaders who were not part of the workshops, including the local neighbourhood police officer and the local councillor, as reported below.

3.3 Activity 3 - Understanding the Community Leaders

Our ten formal interview participants all worked in the community, in either a civil society role (staff or volunteer at charity or community organisation) as an elected member of the local council, or were a council officer. All participants we interviewed were residents of the town, apart the chief officer of one civil society group, the council officer, and one charity worker, who travelled in from neighbouring areas in the region. This was an important part of the selection criteria, as on some level we were putting our interviewees in the position of representatives of the community. They had worked in their current role for between 1.5 and 17 years, for an average time of 7 years. Apart from the elected councilor who had worked in civil society roles previously, all of our participants were employees or volunteers (some worked part-time and volunteered their time over those contracted hours) of their respected civil society organisations.

Members of the research team interviewed participants one-on-one at a location within the community chosen by them. After an interview the researcher asked the interviewee to suggest the next person to interview, and to pass on a request for interview with information about the study. Whichever member of the research team carried out the interview it followed the same semi-structured interview schedule that focused on questions about their role in the community, their experiences of community engagement, what they considered to be the main issues and positive elements of the community, and what information and resources they required to fulfill their role. These interviews were audio-recorded and transcribed for analysis as discussed in the following section.

4 FINDINGS

We present our analysis of the interview transcriptions, following a constructionist, data-driven approach to Braun and Clarke's 'recipe' for thematic analysis [12]. The data is organised into four themes that represent groupings of coded interview data into wider issues that represent our participants' experiences in their own words. *Telling Stories* discusses the negative stereotypes the community face as a result of national data and how they resist these labels; *Keeping it for Themselves* brings to attention how these issues relate to the work of the civil society groups, while also bringing into focus the resources and knowledge in the community across the civil society organisations (specifically, the benefits of joining together these resources and the obstacles surrounding this). Some of these obstacles are highlighted in the third theme, *Pulling Together, Pushing Apart*, which discusses relationships within the community and between the organisations, as well as a lack of trust of those in power. The final theme, *Getting Things Done*, focuses on issues of disempowerment, conflict and loyalty, as well as forms of action. The context for this theme is provided in *Telling Stories* and *Pulling Together, Pushing Apart*, in which issues of 'othering' and trust come to the fore.

4.1 Telling Stories

The community we are engaging with is perennially at the top of the UK government's list of most deprived areas according to the national statistics indicators. Open data, and how this is reported on and conceived, therefore often gives the community a label that brings with it negative perceptions, a reputation associated with anti-social behaviour, and crime.

There is resistance against the 'deprived area' tag which is commonly discussed. One community organisation worker told us the local news media are prone to perpetuating a negative image of the community: *"no matter what you do that's positive, the papers put a negative spin on it"* (P7). The media does not tell the story in a way that is recognisable to the community. P6, a senior member of a charity organisation in the community, discusses this as a representation that is difficult to

control and is surprised by the perception that is constructed: *"I've recently seen two or three films about the estate - and we've been involved in a lot of them. And in each occasion, I've been shocked by the pictures, and they are the things I see every day."* An image–considered misleading–is constructed in this film which focuses on damaged and vandalised buildings or untidy parts of the community.

The media coverage of the community is perceived by P2 as a way of perpetuating negative stereotypes associated with deprivation. The 'deprived' label is referred to as something that is 'used against' the community: *"I mightn't have the best paid job or I'm not in the statistics that say 'this is a high-income job' but you don't humiliate people by saying I'm deprived. [...] A lot of the young'uns were a bit miffed that they were still saying it was sort of deprived, you know they're trying to better themselves"*.

Our participants often reflect that it is easy to show statistics about deprivation, but more difficult to show the positive things that the community organisations do, in their work with residents. From early in our collaboration with the community and partner organisations they discussed a will to create positive stories about the community. One community leader explained this as something they feel is unfair: *"I think they're fiercely proud and loyal to one another [...] and because they've been labelled, they want to sort of rally against it I think"* (P4). There were times when community leaders spoke about part of their role as a responsibility to show positive stories in order to counteract the media portrayal: *"I mean in some respects I think organisations like ours have got a bit of a responsibility to collect...I mean we do collect positive stories of things, that have changed for the better and that's largely why we get up every day and come to work"* (P4). One community leader told us that it was important to them to have forms of information beyond the headline deprivation figures: *"The life stories have got to be part of it, like case studies, that sort of thing." (P6).*

The idea that there were parts of their work that were not easily made visible, was discussed often. For example, P8, who works with young people co-designing projects with the community, articulated the point that their work is not visible to the rest of the community. They used the example of a youth club as a very visible thing in the community and as something one can draw out figures for by using attendance as a metric of success: *"A core group of young people would use that youth centre. But if another group of young people were intimidated by that group they wouldn't come in. So even though you've got 50 or 20 kids there, it doesn't mean to say you're doing an effective service for young people."* Here, doing something positive with a smaller group of marginalised young people is considered something that would not look like an 'effective service' but it is where the real value is in their work.

There is a perception that the services provided by civil society groups is only for those who are struggling. This perspective from the outside world is problematic for the civil society groups in terms of engaging people in community projects, who don't want to be seen as *"tramps or whatever"* for using the services the civil society group provide. Paradoxically, statistics that show deprivation make it easier for them to apply for funding from national funding bodies: *"We're often asked by funder to portray the worst possible picture of the estate"* (P6).

The perceptions that exist within the community present a problem for those working to empower and improve the lives of citizens. On one hand, national statistics data (e.g., the deprivation index) makes it easier for them to get funding to continue as a charity or community organisation. On the other, it makes their task more difficult, because it creates the stigma around using their services and discourages residents from getting involved in civic action. This opens up questions about the role of national statistics data in local decision-making whether it should be part of such processes at all, and what opportunities communities have to create their own stories to challenge what this data represents.

4.2 Keeping it for Themselves

In discussing the day-to-day work of one civil society group, the director explained that it was not the rudimentary, persistent issues and social problems that 'attracted' funding. To apply for funding from national charities concessions, such as focusing on a particular age group or particular social issue, are often needed in order to get the funding. P6 explains: *"So, to try to package that up to a funder who's looking for something that's sparkly and give them lots of press coverage, it's quite difficult to do that".*

Moreover, even when a funding bid is successful there are often caveats attached. P3 described their dismay at the restrictions attached to some funding bids around the circumstances of individuals. For example, they are faced with a difficult situation when they are awarded money to provide and run a service but have to deny access to these services to people they know are in need but who are not eligible for certain social benefits under the Universal Credit scheme[3]. They are awarded funding but cannot legitimately use it to carry out the day-to-day work of the charity: *"and you can only do certain things if you're [the service user] on certain benefits, well it's not providing a service for everyone".*

P7 described a frustration with the facilities their group have, stating that they are underused due to lack of awareness about them within the community: *"I think it would be good for people to see what is available because I think a lot of people on the estate don't know this is here [...] and then you compare it with another area where there's nothing - maybe people will look at it and think 'yea there is things here'".*

It is possible to imagine that sharing information about services would have a significant role in increasing groups' visibility to residents and to each other. Although this data exists it does not seem to be used effectively. In the following quote P8 indicates that the local data the groups hold should be enough to inform the neighbourhood plan: *"Not duplicating what people are already doing. [...] You can feed data into that plan...of what you've got [...] I think we could give you that information using the data we've got."* Reflecting on the agencies that might collect data that would be useful, one community representative suggested that there are several kinds of data collection within the community from medical organisations, community organisations as well as other administrative data: *"I suspect the only people who aren't collecting data in a formal way are the people who live here"* (P4).

The community organisations do not always agree on priorities for the community. Most of the groups told us a priority was to invest in infrastructure for young people which was the result of a data collection exercise carried out by one of the groups: *"we done a survey a few year ago and the priority for that was stuff for kids."* (P7). However, this is challenged by P8 who explained that these misconceptions occurred due to groups not being aware of each other's work: *"And I think the mistake that adults make is 'there's nothing for young people' because they can't physically see it."*

There are contrasting views from one civil society group to another who each do their own research and administrative data collection. They do not, or perhaps cannot, share that data or collate it with one another, leading to misconceptions about what provision already exists and what the priorities should be for the community. Data required to inform a Neighbourhood Plan exists, but it is distributed across different civil society groups, and each group doesn't know what the other groups hold. As such, this data is effectively lost to the Neighbourhood Plan, and other policy processes.

[3]Universal Credit is an unpopular social benefits scheme introduced by the UK Government to replace six previous benefit schemes, including unemployment benefit, tax credits and housing benefit.

4.3 Pulling Together, Pushing Apart

Community initiatives and data-driven interventions have created a distrust toward large charity organisations from residents and local civil society groups. This stems from an issue of data ownership and control, and the way the community's data can be leveraged for top-down interventions that 'miss the point' of the community's issues. Through speaking to the community leaders it quickly became clear there is a history of interventions in the community not only from local but also from national organisations providing short-term courses and carrying out various development projects around new and existing infrastructure. This has prompted concern that national charities, in particular, apply for funding in this specific locality, as a way of doing headline-making work, by virtue of its score on the deprivation index.

Such concerns have led to short-term engagements that end abruptly when the funding runs out: *"A lot of people have tried to do quick fixes but they just need to be here for the people, to support them"* (P3). Many successful projects have closed due to funding running out, which has led to unemployment of local residents, who were employed as part of a project: *"But when they ran out of funding they can't sustain that particular project to employ those people anymore, the project itself sort of closed down."* (P4). One significant project involving substantial *"European money"* was invested in two new developments in the area. Residents felt let down by unfulfilled promises that it would create employment for the area: *"I mean I think the residents were promised that they would employ local people of the estate and they brought outside contractors in. So, everything that the people on the estate got promised didn't materialise"* (P1). P8, an experienced youth worker reflected about what it takes to make a difference in the community: *"I think the worst thing you can do as an outsider, as a professional, is to come into an area and then assume things and do to people rather than identify what their needs are."*

P2, a worker and volunteer in a charity that focuses on getting people back into employment, explained that when trying to encourage residents to take part in civic action designed to improve their quality of life, they would often get a negative response because of residents' apathy towards the local authority borne out of an overwhelming sense of residents not having a voice: *"Yeah, 'is it really worth it?' 'Will it happen?' [...] that is the difference."* This seemed to discourage the civil society groups from association with the local authority. Instead, they felt it was better to be 'on the side of' the residents. During our time with the community the local authority have arranged events where the attendance is much lower than events organised by the community groups.

There are some local authority officers that are respected within the community but, interestingly, these public officials are described in a way that portrays them as autonomous from the local authority: *"I mean I know if we see glass lying around and that we can phone because we've got good links with [Anon: local authority office]. We just say 'look there's graffiti on the wall can you come down and get it off?' Or 'there's glass down here' and he'll just come and do it straight away."* (P1).

The groups feel they should show a loyalty to residents in the community who have been let down in the past by the local authority: *"They haven't been listened to in the past so they're a bit reluctant [...] so they just think 'let's not bother, it's not worth it'"* (P3). One community leader we interviewed identified the barrier to involving residents in the Neighbourhood Plan is: *"I think people locally are quite wary of the council, they don't see them in a friendly way."* (P4).

P1 described the connection of the Plan with the local authority as the single most problematic barrier and even discussed thinking about being able to disguise or obfuscate the local authority's role in this: *"You can't guarantee that most of the residents on here won't want to work with the Council. If we say 'we had to involve' - which you do, have to involve your local council - they'll be ((makes noises of disinterest)) because they've been promised that much off the council in the past and it's never materialised"* (P1).

P4 talked of changing the terminology as a solution: *"I mean the word 'neighbourhood plan' sounds a bit kind of 'local authority' doesn't it [...] it's about maybe changing some of the language."* Typically, issues of ownership are a challenge in data-driven projects. In the community we were working with, the local authority is discussed as a 'guardian' of the data: *"at the minute, unless you go to the Council you don't know what data is where."* (P1). Civil society groups do not have easy access to local authority or national statistics data. As such, data ownership is the root of some distrust among them. The relationship with some groups is so degraded that it would be difficult to arrange access and support: *"That political support, you would have thought would have been easily obtainable wasn't."* (P6).

There is also a distrust linked with power and a sense that there is a paternal inequitable relationship. *"I think you can prove anything with numbers and certainly politicians have shown us you can just pluck numbers out of the air."* (P6). This is representative of a national distrust exemplified by press stories of senior political figures misusing national statistics for political gain and being 'outed' in the press.

Community leaders we spoke to reflected that time was the key factor in building trust with the community. The amount of time spent getting to know all of the agencies is often stated very clearly, with an emphasis on time and not being able to take shortcuts: *"you talk to other agencies, you visit all the other agencies, you talk to the churches, you talk to the people in the community - parents, people who live here."* (P8). This particular civil society organisation has been in the community for almost four decades, and gives insight into the negative perception civil society groups have for interventions from the local authority or national charities: *"a couple of weeks programme doesn't work, you need long-term"* (P3).

There are issues of trust between citizens and the local authority that act as a barrier to engagement. Civil society have a distrust of the local authority, particularly around ownership of data, and based on past experiences share a mistrust of the local authority with residents, which caused barriers to engagement with civil society groups around the Neighbourhood Plan process.

4.4 Getting Things Done

When discussing the data we prepared for the paper prototype map (see fig. 1) used in the workshops, one community leader talked about a concern that the level of granularity of the data might generate tensions within the community. It could create divisions between residents, in particular when some sections of the community could be compared with another: *"The whole area is deprived, not that street's worse of than that street so if I cross the road I'm going to be better off than them that live there, but I'm still living on the estate. That's crap!"* (P1).

Often language used in the interviews reflected the sense that civil society organisations were there to 'fight' on behalf of the community, in particular, against the local authority: *"We had to fight to get a bigger building, we had to fight the Council and it got nasty in parts, it wasn't an easy job"* (P6). This sense of having to look out for one another was dominant. For residents, this is discussed as existing within one particular community group. As discussed above, there are three main organisations in the community, each having a different mission statement but with a lot of overlap in terms of basic community services. A sense of 'rivalry' and partisan attitude exists between these groups:*"[There are] tensions within the community in terms of loyalty, and you know, whether or not they'll come to this building [...] it's not exactly tribalism, but there is a bit of that sort of sense that a community tends to cluster around specific organisations or specific people"* (P4).

Residents who use the services of the civil society groups we worked with felt a sense of loyalty to the group. This is in contrast to their feelings toward the local authority who, despite carrying out community engagement work and funding projects in the area, are not seen favorably. P6, a long-serving community organisation worker in a charity, explained to us that the sense of apathy

and disenfranchisement stems from bad experiences: *"And maybe that pride is a bit of bravado and a bit of 'we can cope' but in fairness they've had a lot thrown at them over the years and they've come out - they're still surviving."*

As a research team, we would often be warned that, based on past experiences, getting people involved in projects would be difficult, and for valid reasons. P1, reflecting on their own experiences advised us that residents would need to see change happen before getting involved: *"I think that if they knew they had the voice and they also had the power to say 'no you're not building on there' [...] 'that you have to come through us first before they can do it' I think that would probably give them a little bit of thinking 'oh right, I can now finally have a say.'"* (P1) The way the civil society groups discuss their interactions with the local authority shows they have had to adopt a partisan position to achieve their goals for the residents. Communication at times goes along a more lobbyist or activist approach: *"because we kept on at the Council [...] and we kept it on the agenda and we kept forcing it"* (P8).

In order to build a sense of community and protect those who used their services, the civil society workers often spoke of their roles as acting on behalf of residents. The civil society actors are committed to the idea of the Neighbourhood Plan as a tool for raising engagement that creates an opportunist moment in order to fulfil their wider agenda around social cohesion and improving the lives of people in the community. However, there is a need to maintain a sense of being 'on the side' of residents rather than with the local authority. Another issue is the timescales of decision-making processes and eventual outcomes. For example, P8 is concerned that the way the Neighbourhood Plan process works will never suit any of the young people they work with: *"I'd struggle to get young people along to a meeting about the community plan (sic) [...] they don't want to come and talk about it, they want to go straight to direct action"*. P6 echoed this frustration at the challenge of knowing the best form of civic action, relating it to issues of disenfranchisement and power: *"I think sometimes there's a will to change but they just don't know the way to do it [...] it's difficult to change from a position where you've got no power."*

The slowness of official decision-mkaing processes are at odds with the 'direct action' residents have become used to when working with community leaders. This creates a gap between engagement and action, as well as a "participation gap" [1], whereby it is more difficult for some sections of the community to take part than others. In the next section we discuss how digital technologies may support the issues with data and collaboration, and promote a more active citizenry, as well as facilitate civic advocacy.

5 DISCUSSION

The tensions around using open datasets (e.g. national statistics) for local decision-making are those of context, meaning and access. In trying to investigate these tensions our findings highlight the experiences civil society organisations face when given devolved decision-making responsibility, as well as their their relationship with data, the local authority, and the citizens in their community. In the following sections, we draw on some key issues: how we should define the negotiation between data, knowledge, and action; how new forms of participation might add legitimacy in new structures of governance; and how community resources and access to shared data might promote a more capable citizenry.

5.1 Defining Neighbourhood Data

The Office for National Statistics (the body responsible for collecting, storing and making available open data in the UK), defines 'neighbourhood data' as local statistics or small area data derived from national statistics. When we asked our participants about neighbourhood data they started by describing demographics and simple statistics like employment and occupancy rates but on

closer inspection, the types of data that did affect their lives came from a multitude of sources (e.g., administrative data, services, residents' stories, availability and use of community resources). The way that open data from national sources could be meaningful to them would mean being able to contextualise it with other local sources of data, such as the organisation's own administrative data, and stories and opinions from residents.

Participants in the study did not recognise their own neighbourhood in the official data with which they were presented. The data made people feel they were misrepresented and they put distance between themselves and the data. We emphasise the importance of neighbourhood data as more than the data captured about the community and held by authorities; it also includes the data produced by the community. As discussed by our participants, data that is held by community organisations and local people could be useful in policymaking at a neighbourhood level, but beyond that including experiential stories that make people's feelings and successes visible can promote a better understanding and sense of community.

One important principle that comes from our research (and is reflected in prior work) is that the community is more important than 'data' to the extent that, although data is useless without a group of citizens, a group of citizens can still make things happen without data. The concept of neighbourhood data encompasses ideas of building a sense of community through the sharing of positive stories, as well as through sharing resources and data. Only then can we begin to expect any positive civic action to occur. As such, there is a need for a greater understanding of the types of data that are important and have value and relevance in data-driven design processes. When taking on data-driven decision-making design projects we cannot make an assumption that everything that we count, counts, or that everything that counts, is counted [14]. Our findings suggest that *neighbourhood data* is whatever a community cares about enough to measure.

5.2 Building Democratic Capacity to Inform and Legitimise Policy

Previous work in HCI shows that gathering opinions and views of citizens is often the easy part, but the problem lies in the link between engagement and action [41, 71, 72]. Others have discussed the idea of a 'black hole' [2, 46, 48] to reflect the tendency for local views and community contributions to become lost in the system and have no tangible impact on the policy process. We relate this to issues of 'legitimacy'. Because decisions are made without engaging those whose lives are affected, the policymakers themselves are not trusted, nor are the decisions seen to reflect the views of a community. As such, the decisions made by those in power are not considered 'legitimate' by the citizens. This manifests in issues we found around lack of trust and disempowerment.

Another side of the 'legitimacy' issue is to do with what democratic theorists call 'transmission' [10]. One problem with civil society organisations in instances of devolved decision-making with forms of engagement that include dialogic forms of expression is presenting the expressed viewpoints of citizens in a way that the local authority can understand. It may not be the case that the local authority is not listening, but rather that they cannot translate what citizens are saying into action. Moving towards integrating dialogic forms of participation with relevant datasets is one way to make such forms of participation meaningful to decision-makers, legitimising the expressions of concern for decision-makers. Access to, and the ability to use the same data that the council use as a resource for civic action could be an important step in having their voices heard, as discussed in section 5.3.

There was a belief that data could give people a voice or empower them, but it is the consequence of that voice that is a major concern in projects and initiatives such as those discussed in this study. Making that voice, which is exhibited as storytelling and dialogue among residents on matters of concern [19], part of the evidence for decision-making is one way of making processes not only more inclusive, but legitimate to citizens through their own involvement. This could also be true of

involvement of other citizens who act as 'trusted proxies' [31] in instances where trust for public officials in representative democracies is lacking.

A final point on legitimacy is that of 'democratic legitimacy' which comes from inclusivity of democratic processes [21, 51]. The civil society groups we worked with were required to provide evidence for writing funding bids to funding bodies and to persuade the local authority for more resources. This raises concerns that civil society groups will privilege doing the type of work that gets recognition or that is simple to represent with statistics at the cost of excluding those in the community they understand as having the most need for support. There was a recognition that their success stories or their fundamental services could not be turned into data that could be understood by decision-makers. Community mapping projects have shown to be successful as an engagement method [23, 66] and in policymaking [59]. They offer a means for citizens to engage in a form of participation that is more engaging than a vote and more meaningful then a town hall meeting. One of the aims of Neighbourhood Planning is to represent *"counter-narratives to the dominant planning paradigm"* [13]. Further, research into engagement in the planning process has suggested that novel 'storytelling' approaches can empower people who feel they are 'missing' from the data [52].

5.3 Building Epistemic Capacity to Promote a More Capable Citizenry

In our study, it was clear that there was potentially a myriad data collected and used within the community as a resource for funding bids and service design, dispersed across a range of institutions. At least one problem with this manifests itself through an apparent discrepancy in the priorities identified by some groups compared to others. A way for them to share their administrative data could mean a shared knowledge that would benefit the whole community. They could use data that exists within and about the community to co-ordinate their services better across the town.

This is in line with recent work on 'neighbourhood data' that has pointed to the need for, and potential benefits of local hubs for resources, knowledge-sharing and understanding [3, 6, 18]. As well as sharing data, these projects involved co-designing data collection (sensor) tools, and collaboration with stakeholders [6], providing training so that residents could collect their own interview data [3], and using citizen-generated image data to allow citizens to express, critically, their local environment [18]. All three of these studies in different ways discuss creating a link between empowered and informal arenas through building epistemic capacity of citizens. In a sense, hubs such as this form a kind of 'public sphere' where ideas are formed and articulated, but the route from these ideas to empowered spaces is of utmost importance. However, the idea of a 'data commons' does not automatically create a more capable citizenry, and in many cases relies on resources (scientists, hardware) that are not always available.

The data commons concept could be applied to systems that could function as local data repositories owned by the community and managed by a collective of community organisations. This would give civil society groups access to more meaningful local data which could in turn benefit citizens. When done across various agencies who hold data in the community, this has the potential to open up opportunities to promote better public judgment on issues, as well as a citizenry capable of healthier and more informed civic action. When citizens encounter nonpartisan information and have opportunities for fair and honest dialogue, this creates *"probably as powerful a way to help public judgment evolve as has been devised"* [28, p19].

Sharing resources in this way has also been found to promote increased social interaction and the sharing of skills [6]. Practically, it could help avoid redundancy of service provision and promote collaboration between institutions and civil society groups within a community. These ideas of a 'data commons' bring other possibilities. A local repository of *neighbourhood data* could also support new agencies that come into the town to carry out community-driven work avoiding the

cold-start that external agencies are faced with. It could be used to gain an understanding of the community needs and the availability of existing resources.

This raises questions around governance, privacy and ethics. The above studies indicate initiatives should be community-driven rather than top-down and forced. An alternative view to governance is highlighted in *Citizen-Generated Data and Governments* [74] where it is indicated that Government could or should host such resources. In *HCI, Civic engagement & Trust* [38] the authors call for civic technology design that is sensitive to the needs of both civic authorities and citizens, moving away from what they identified as an almost exclusive focus on 'empowering citizens'.

Other work has called for reflection on system design to *"better cater to these kinds of political work and facilitate illegitimate civic participation as a valuable and significant means of practicing democracy"* [2, p1702]. A big concern for our participants working in civil society organisations was their ability to show evidence of the work they did. In the past their most successful form of civic action and communication with the local authority came from a type of 'disruption' rather than consensus [43]. However, this form of advocacy was not always appropriate. Much participatory design follows Mouffe's theory of democracy [54] in discussing 'agonistic spaces' [8], but our work suggests a deliberative democracy approach that better supports political discussion that encourages reciprocity should be catered for by designers of civic technologies.

5.4 Concluding Remarks

Designers of platforms and infrastructure for *neighbourhood data* should seek to build systems that accommodate a more nuanced take on the interplay between data, knowledge, information and action. First, we should construct *neighbourhood data* as building democratic capacity. Our work suggests that we should think of data as a continuum that flows both ways. To render this a legitimate form of participation it must also be translated and transmitted from informal arenas to formal arenas of power in a form that is both 'situated' and as a "resource for action" [68] for both ends of the continuum, in order to position data as a negotiation between arenas of power. Second, in order to build epistemic capacity, data need to be relevant. What data makes sense or is valuable needs to be context-specific, as well as 'open' to multiple forms of action. As such, the challenge is to create infrastructure to enable a multitude of expressions, sensitive to the ideas that data are 'situated' not just by 'place' but by a plethora of socio-material and temporal contexts, and broaden our definition of 'action' to include a range of purposes including facilitating the forming of opinions not just the articulation or expression of existing views.

6 CONCLUSION

Through investigating the tensions at play in situations where ordinary citizens are carrying out decision-making process and interfacing with government and national statistics, we discovered a complex set of tensions. In discussing the implications of our work we have argued for the inclusion of data that effects people's perceptions of community beyond national statistics and the idea of *neighbourhood data* as a concept for re-imagining the relationship between data, people, knowledge, and action. Through our findings and the resulting principles for future designs, we want to bring together ideas on the role of open data, the role of civil society, and the way this converges with government policymaking processes. We have discussed the idea of bringing legitimacy to devolved decision-making processes through the use of data as a resource for citizen deliberation so that it might be contextualised to offer a utility to decision-makers that works for citizens.

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REFERENCES

[1] Necla Acik. 2013. Reducing the participation gap in civic engagement: Political consumerism in Europe. *European Sociological Review* 29, 6 (12 2013), 1309–1322. DOI: http://dx.doi.org/10.1093/esr/jct016

[2] Mariam Asad and Christopher A. Le Dantec. 2015. Illegitimate Civic Participation. In *Proceedings of the 18th ACM Conference on Computer Supported Cooperative Work & Social Computing - CSCW '15*. ACM Press, New York, New York, USA, 1694–1703. DOI: http://dx.doi.org/10.1145/2675133.2675156

[3] Mariam Asad, Christopher A. Le Dantec, Becky Nielsen, and Kate Diedrick. 2017. Creating a Sociotechnical API: Designing City-Scale Community Engagement. In *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems - CHI '17*. ACM Press, New York, New York, USA, 2295–2306. DOI: http://dx.doi.org/10.1145/3025453.3025963

[4] Stefan Baack. 2015. Datafication and empowerment: How the open data movement re-articulates notions of democracy, participation, and journalism. *Big Data & Society* 2, 2 (12 2015), 205395171559463. DOI: http://dx.doi.org/10.1177/2053951715594634

[5] Mark Baker, Jon Coaffee, and Graeme Sherriff. 2007. Achieving successful participation in the new UK spatial planning system. *Planning Practice and Research* 22, 1 (2 2007), 79–93. DOI: http://dx.doi.org/10.1080/02697450601173371

[6] Mara Balestrini, Yvonne Rogers, Carolyn Hassan, Javi Creus, Martha King, and Paul Marshall. 2017. A City in Common: A Framework to Orchestrate Large-scale Citizen Engagement around Urban Issues. In *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems - CHI '17*. ACM Press, New York, New York, USA, 2282–2294. DOI: http://dx.doi.org/10.1145/3025453.3025915

[7] Mara Balestrini, Yvonne Rogers, and Paul Marshall. 2015. Civically engaged HCI. In *Proceedings of the 2015 British HCI Conference on - British HCI '15*. ACM Press, New York, New York, USA, 35–36. DOI: http://dx.doi.org/10.1145/2783446.2783590

[8] Erling Björgvinsson, Pelle Ehn, and Per Anders Hillgren. 2012. Agonistic participatory design: Working with marginalised social movements. *CoDesign* 8, 2-3 (6 2012), 127–144. DOI: http://dx.doi.org/10.1080/15710882.2012.672577

[9] Kirsten Boehner and Carl DiSalvo. 2016. Data, Design and Civics: An Exploratory Study of Civic Tech. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems - CHI '16*. ACM Press, New York, New York, USA, 2970–2981. DOI: http://dx.doi.org/10.1145/2858036.2858326

[10] John Boswell, Carolyn M. Hendriks, and Selen A. Ercan. 2016. Message received? Examining transmission in deliberative systems. *Critical Policy Studies* 10, 3 (7 2016), 263–283. DOI: http://dx.doi.org/10.1080/19460171.2016.1188712

[11] Eva Brandt and JÃűrn Messeter. 2004. Facilitating collaboration through design games. In *Proceedings of the eighth conference on Participatory design Artful integration: interweaving media, materials and practices - PDC 04*, Vol. 1. ACM Press, New York, New York, USA, 121. DOI: http://dx.doi.org/10.1145/1011870.1011885

[12] Virginia Braun and Victoria Clarke. 2008. Using thematic analysis in psychology. *Qualitative Research in Psychology* 3, 2 (7 2008), 77–101.

[13] Sue Brownill and Quintin Bradley. 2017. *Localism and neighbourhood planning : power to the people?* Policy Press.

[14] Cameron William Bruce. 1963. *Informal Sociology: A Casual Introduction to Sociological Thinking*. Random House, New York, New York, USA.

[15] DCLG - Department for Communities and Local Government. 2011. Localism Act. (2011). http://www.local.gov.uk/localism/localism-act

[16] Department for Communities and Local Government. 2014. *Delivering Differently in Neighbourhoods*. Technical Report. Department for Communities and Local Government. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/369509/Delivering_Differently_in_Neighbourhoods_-_prospectus.pdf

[17] Department for Communities and Local Government. 2017. Neighbourhood Planiing Bill: Factsheet. (2017).

[18] Julia Díez, Paloma Conde, MarÃŋa Sandin, MarÃŋa Urtasun, Remedios López, JosÃĺ Luis Carrero, Joel Gittelsohn, and Manuel Franco. 2017. Understanding the local food environment: A participatory photovoice project in a low-income area in Madrid, Spain. *Health and Place* 43 (2017), 95–103. DOI: http://dx.doi.org/10.1016/j.healthplace.2016.11.012

[19] Carl DiSalvo, Jonathan Lukens, Thomas Lodato, Tom Jenkins, and Tanyoung Kim. 2014. Making public things. In *Proceedings of the 32nd annual ACM conference on Human factors in computing systems - CHI '14*. ACM Press, New York, New York, USA, 2397–2406. DOI: http://dx.doi.org/10.1145/2556288.2557359

[20] John S. Dryzek. 1990. *Discursive democracy : politics, policy, and political science*. Cambridge University Press. 254 pages.

[21] Jonn S. Dryzek. 2009. Democratization as Deliberative Capacity Building. *Comparative Political Studies* 42, July (2009), 1379–1402. DOI: http://dx.doi.org/10.1177/0010414009332129

[22] Pelle Ehn. 2008. Participation in design things. *Conference on Participatory Design* (2008), 92âĂŞ101. DOI: http://dx.doi.org/10.1145/1795234.1795248

[23] Sarah Elwood. 2008. Volunteered geographic information: Future research directions motivated by critical, participatory, and feminist GIS. (8 2008). DOI: http://dx.doi.org/10.1007/s10708-008-9186-0

[24] Sheena Erete and Jennifer O. Burrell. 2017. Empowered Participation: How Citizens Use Technology in Local Governance. In *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems - CHI '17*. ACM Press, New York, New York, USA, 2307–2319. DOI: http://dx.doi.org/10.1145/3025453.3025996

[25] Sheena L. Erete, Emily Ryou, Geoff Smith, Khristina Marie Fassett, and Sarah Duda. 2016. Storytelling with Data: Examining the Use of Data by Non-Profit Organizations. In *Proceedings of the 19th ACM Conference on Computer-Supported Cooperative Work & Social Computing - CSCW '16*. ACM Press, New York, New York, USA, 1271–1281. DOI: http://dx.doi.org/10.1145/2818048.2820068

[26] Mette Agger Eriksen, Eva Brandt, Tuuli Mattelmäki, and Kirsikka Vaajakallio. 2014. Taking design games seriously. In *Proceedings of the 13th Participatory Design Conference on Research Papers - PDC '14*. ACM Press, New York, New York, USA, 101–110. DOI: http://dx.doi.org/10.1145/2661435.2661447

[27] Frank Fischer. 2006. Participatory Governance as Deliberative Empowerment: The Cultural Politics of Discursive Space. *The American Review of Public Administration* 36, 1 (3 2006), 19–40. DOI: http://dx.doi.org/10.1177/0275074005282582

[28] Will Friedman. 2006. Deliberative Democracy and the Problem of Scope. *Journal of Public Deliberation* 2, 1 (2006), 1–29.

[29] Nick. Gallent and Steve. Robinson. 2012. Neighbourhood planning : communities, networks and governance. (2012).

[30] John Gastil, Laura Black, and Kara Moscovitz. 2008. Ideology, Attitude Change, and Deliberation in Small Face-to-Face Groups. *Political Communication* 25, 1 (2 2008), 23–46. DOI: http://dx.doi.org/10.1080/10584600701807836

[31] John Gastil, Robert Richards, Katherine Knobloch, and Katherine Knobloch. 2007. Vicarious Deliberation: How the Oregon Citizens' Initiative Review Influenced Deliberation in Mass Elections. *International Journal of Communication* 8 (2007), 28. http://ijoc.org/index.php/ijoc/article/view/2235

[32] William Gaver, Liliana Ovalle, Andy Boucher, Nadine Jarvis, David Cameron, Mark Hauenstein, Sarah Pennington, John Bowers, James Pike, and Robin Beitra. 2016. The Datacatcher. *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems - CHI '16* (2016), 1597–1607. DOI: http://dx.doi.org/10.1145/2858036.2858472

[33] Connie Golsteijn, Sarah Gallacher, Licia Capra, and Yvonne Rogers. 2016. Sens-Us. In *Proceedings of the 2016 ACM Conference on Designing Interactive Systems - DIS '16*. ACM Press, New York, New York, USA, 39–49. DOI: http://dx.doi.org/10.1145/2901790.2901877

[34] Connie Golsteijn, Sarah Gallacher, Lisa Koeman, Lorna Wall, Sami Andberg, Yvonne Rogers, and Licia Capra. 2015. VoxBox. In *Proceedings of the Ninth International Conference on Tangible, Embedded, and Embodied Interaction - TEI '14*. ACM Press, New York, New York, USA, 201–208. DOI: http://dx.doi.org/10.1145/2677199.2680588

[35] Eric Gordon, Becky E. Michelson, and Jason Haas. 2016. @Stake: A Game to Facilitate the Process of Deliberative Democracy. In *Proceedings of the 19th ACM Conference on Computer Supported Cooperative Work and Social Computing Companion - CSCW '16 Companion*. ACM Press, New York, New York, USA, 269–272. DOI: http://dx.doi.org/10.1145/2818052.2869125

[36] Amy Gutmann and Dennis Thompson. 2004. *Why Deliberative Democracy?* Princeton University Press.

[37] David. Hakken. 2003. *The Knowledge Lanscapes of Cyberspace*. Routledge. 428 pages.

[38] Mike Harding, Bran Knowles, Nigel Davies, and Mark Rouncefield. 2015. HCI, Civic Engagement & Trust. In *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems - CHI '15*. ACM Press, New York, New York, USA, 2833–2842. DOI: http://dx.doi.org/10.1145/2702123.2702255

[39] Carolyn M. Hendriks. 2016. Coupling citizens and elites in deliberative systems: The role of institutional design. *European Journal of Political Research* 55, 1 (2 2016), 43–60. DOI: http://dx.doi.org/10.1111/1475-6765.12123

[40] Ian G. Johnson, Alistair MacDonald, Jo Briggs, Jennifer Manuel, Karen Salt, Emma Flynn, and John Vines. 2017. Community Conversational: Supporting and Capturing Deliberative Talk in Local Consultation Processes. In *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems - CHI '17*. ACM Press, New York, New York, USA, 2320–2333. DOI: http://dx.doi.org/10.1145/3025453.3025559

[41] Ian G. Johnson, John Vines, Nick Taylor, Edward Jenkins, and Justin Marshall. 2016. Reflections on Deploying Distributed Consultation Technologies with Community Organisations. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems - CHI '16*. ACM Press, New York, New York, USA, 2945–2957. DOI: http://dx.doi.org/10.1145/2858036.2858098

[42] Ben Kisby. 2010. The Big Society: Power to the People? *The Political Quarterly* 81, 4 (10 2010), 484–491. DOI: http://dx.doi.org/10.1111/j.1467-923X.2010.02133.x

[43] Matthias Korn and Amy Voida. 2015. Creating Friction: Infrastructuring Civic Engagement in Everyday Life. *Aarhus Series on Human Centered Computing* 1, 1 (10 2015), 12. DOI: http://dx.doi.org/10.7146/aahcc.v1i1.21198

[44] Jonathan W. Kuyper. 2016. Systemic Representation: Democracy, deliberation, and Nonelectoral Representatives. *American Political Science Review* 110, 2 (2016), 308–324.

[45] Alan Lawton and Michael Macaulay. 2014. Localism in Practice: Investigating Citizen Participation and Good Governance in Local Government Standards of Conduct. *Public Administration Review* 74, 1 (1 2014), 75–83. DOI: http://dx.doi.org/10.1111/puar.12161

[46] Christopher Le Dantec. 2012. Participation and publics. In *Proceedings of the 2012 ACM annual conference on Human Factors in Computing Systems - CHI '12*. ACM Press, New York, New York, USA, 1351 – 1360. DOI: http://dx.doi.org/10.1145/2207676.2208593

[47] Christopher A. Le Dantec, Mariam Asad, Aditi Misra, and Kari E. Watkins. 2015. Planning with Crowdsourced Data. In *Proceedings of the 18th ACM Conference on Computer Supported Cooperative Work & Social Computing - CSCW '15*. ACM Press, New York, New York, USA, 1717–1727. DOI: http://dx.doi.org/10.1145/2675133.2675212

[48] Christopher A. Le Dantec and W. Keith Edwards. 2010. Across boundaries of influence and accountability. In *Proceedings of the 28th international conference on Human factors in computing systems - CHI '10*. ACM Press, New York, New York, USA, 113. DOI: http://dx.doi.org/10.1145/1753326.1753345

[49] Sian E. Lindley, Anja Thieme, Alex S. Taylor, Vasilis Vlachokyriakos, Tim Regan, and David Sweeney. 2017. Surfacing Small Worlds through Data-In-Place. *Computer Supported Cooperative Work (CSCW)* 26, 1-2 (4 2017), 135–163. DOI: http://dx.doi.org/10.1007/s10606-017-9263-3

[50] Jane Mansbridge. 2012. *Deliberative Systems: Deliberative Democracy at the Large Scale*. Cambridge University Press, New York.

[51] Jane Mansbridge. 2014. What Is Political Science For? *Perspectives on Politics* 12, 01 (2014), 8–17. DOI: http://dx.doi.org/10.1017/S153759271300368X

[52] Jennifer Manuel, Geoff Vigar, Tom Bartindale, and Rob Comber. 2017. Participatory Media. In *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems - CHI '17*. ACM Press, New York, New York, USA, 1688–1701. DOI: http://dx.doi.org/10.1145/3025453.3025745

[53] Viktor Mayer-Schönberger and Kenneth. Cukier. 2013. *Big Data: A Revolution that Will Transform how We Live, Work, and Think*. Houghton Mifflin Harcourt. 242 pages.

[54] Peter McLaverty. 2009. Is deliberative democracy the answer to representative democracy's problems? A consideration of the UK government's programme of citizens' juries. *Representation* 45, 4 (11 2009), 379–389. DOI: http://dx.doi.org/10.1080/00344890903236957

[55] Ricardo Fabrino Mendonça. 2016. Mitigating systemic dangers: the role of connectivity inducers in a deliberative system. *Critical Policy Studies* 10, 2 (4 2016), 171–190. DOI: http://dx.doi.org/10.1080/19460171.2016.1165127

[56] National Association of Local Councils. 2017. *Where next for localism?* Technical Report. https://www.nalc.gov.uk/news/entry/841-where-next-for-localism

[57] Michael A. Neblo. 2005. Thinking through Democracy: Between the Theory and Practice of Deliberative Politics. *Acta Politica* 40, 2 (7 2005), 169–181. DOI: http://dx.doi.org/10.1057/palgrave.ap.5500102

[58] Patrick Olivier and Peter Wright. 2015. Digital civics. *Interactions* (2015), 61–63.

[59] Wayne Parsons. 2004. Not Just Steering but Weaving: Relevant Knowledge and the Craft of Building Policy Capacity and Coherence. *Australian Journal of Public Administration* 63, 1 (3 2004), 43–57. DOI: http://dx.doi.org/10.1111/j.1467-8500.2004.00358.x

[60] Hanna-Kaisa Pernaa. 2017. Deliberative future visioning: utilizing the deliberative democracy theory and practice in futures research. *European Journal of Futures Research* 5, 13 (2017). DOI: http://dx.doi.org/10.1007/s40309-017-0129-1

[61] Alenka Poplin. 2012. Playful public participation in urban planning: A case study for online serious games. *Computers, Environment and Urban Systems* 36, 3 (5 2012), 195–206. DOI: http://dx.doi.org/10.1016/j.compenvurbsys.2011.10.003

[62] Erna Ruijer, Stephan Grimmelikhuijsen, and Albert Meijer. 2017. Open data for democracy: Developing a theoretical framework for open data use. *Government Information Quarterly* 34, 1 (1 2017), 45–52. DOI: http://dx.doi.org/10.1016/j.giq.2017.01.001

[63] Ian Sanderson. 2002. Evaluation, Policy Learning and Evidence-Based Policy Making. *Public Administration* 80, 1 (1 2002), 1–22. DOI: http://dx.doi.org/10.1111/1467-9299.00292

[64] Douglas Schuler. 2013. Creating the World Citizen Parliament. (2013).

[65] Keith Shaw and Mark Tewdwr-Jones. 2016. "Disorganised Devolution": Reshaping Metropolitan Governance in England in a Period of Austerity. *Raumforschung und Raumordnung* (10 2016), 1–14. DOI: http://dx.doi.org/10.1007/s13147-016-0435-2

[66] Jennifer Shkabatur. 2014. Interactive Community Mapping: Between Empowerment and Effectiveness. In *Closing the feedback Loop: Can Technology Briidge the Accountability Gap?*, Bjorn-Soren Gigler and Savita Bailur (Eds.). The World Bank, Washington D.C., Chapter 4, 71 – 107.

[67] John Sturzaker and Dave Shaw. 2015. Localism in practice: lessons from a pioneer neighbourhood plan in England. *Town Planning Review* 86, 5 (9 2015), 587–609. DOI: http://dx.doi.org/10.3828/tpr.2015.34

[68] Lucy A. Suchman. 2007. *Human-Machine Reconfiguration. Plans and Situated Actions.* Cambridge University Press. 314 pages. DOI: http://dx.doi.org/10.1017/CBO9780511808418

[69] Roger Sykes. 2003. *Planning Reform: a survey of local authorities.* Technical Report. Local Government Association, London.

[70] Alex S. Taylor, Sian Lindley, Tim Regan, David Sweeney, Vasilis Vlachokyriakos, Lillie Grainger, and Jessica Lingel. 2015. Data-in-Place. In *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems - CHI '15.* ACM Press, New York, New York, USA, 2863–2872. DOI: http://dx.doi.org/10.1145/2702123.2702558

[71] Nick Taylor, Justin Marshall, Alicia Blum-Ross, John Mills, Jon Rogers, Paul Egglestone, David M. Frohlich, Peter Wright, and Patrick Olivier. 2012. Viewpoint. In *Proceedings of the 2012 ACM annual conference on Human Factors in Computing Systems - CHI '12.* ACM Press, New York, New York, USA, 1361. DOI: http://dx.doi.org/10.1145/2207676.2208594

[72] Vasilis Vlachokyriakos, Rob Comber, Karim Ladha, Nick Taylor, Paul Dunphy, Patrick McCorry, and Patrick Olivier. 2014. PosterVote: Expanding the Action Repertoire for Local Political Activism. In *Proceedings of the 2014 conference on Designing interactive systems - DIS '14.* ACM Press, New York, New York, USA, 795–804. DOI: http://dx.doi.org/10.1145/2598510.2598523

[73] Etienne Wenger. 1998. *Communities of practice : learning, meaning, and identity.* Cambridge University Press, Cambridge. 318 pages.

[74] Christopher Wilson and Zara Rahman. 2015. *Citizen-Generated Data and Governments: Towards a Collaborative Model.* Technical Report. 16 pages. http://civicus.org/images/citizen-generateddataandgovernments.pdf

[75] Annika Wolff, Matthew Barker, and Marian Petre. 2017. Creating a datascape: A game to support communities in using open data. *ACM International Conference Proceeding Series* Part F1285 (2017), 135–138. DOI: http://dx.doi.org/10.1145/3083671.3083686

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