



THE UNIVERSITY *of* EDINBURGH

Edinburgh Research Explorer

Processes of proliferation

Impact beyond scaling in sharing and collaborative economies

Citation for published version:

Lampinen, A, Light, A, Rossitto, C, Fedosov, A, Bassetti, C, Bernat, A, Travlou, P & Avram, G 2022, Processes of proliferation: Impact beyond scaling in sharing and collaborative economies. in *Proceedings of the ACM on Human-Computer Interaction*. vol. 6, 41, Proceedings of the ACM on Human-Computer Interaction, no. 41, vol. 6, ACM, New York, pp. 1-22. <https://doi.org/10.1145/3492860>

Digital Object Identifier (DOI):

[10.1145/3492860](https://doi.org/10.1145/3492860)

Link:

[Link to publication record in Edinburgh Research Explorer](#)

Document Version:

Publisher's PDF, also known as Version of record

Published In:

Proceedings of the ACM on Human-Computer Interaction

General rights

Copyright for the publications made accessible via the Edinburgh Research Explorer is retained by the author(s) and / or other copyright owners and it is a condition of accessing these publications that users recognise and abide by the legal requirements associated with these rights.

Take down policy

The University of Edinburgh has made every reasonable effort to ensure that Edinburgh Research Explorer content complies with UK legislation. If you believe that the public display of this file breaches copyright please contact openaccess@ed.ac.uk providing details, and we will remove access to the work immediately and investigate your claim.



Processes of Proliferation: Impact Beyond Scaling in Sharing and Collaborative Economies

AIRI LAMPINEN, Stockholm University, Sweden

ANN LIGHT, University of Sussex, United Kingdom and Malmö University, Sweden

CHIARA ROSSITTO, Stockholm University, Sweden

ANTON FEDOSOV, University of Zurich, Switzerland

CHIARA BASSETTI, University of Trento, Italy and Italian National Research Council (CNR), Italy

ANIKO BERNAT, TARKI Social Research Institute, Hungary

PENNY TRAVLOU, University of Edinburgh, United Kingdom

GABRIELA AVRAM, University of Limerick, Ireland

While scalability and growth are key concerns for mainstream, venture-backed digital platforms, local and location-oriented collaborative economies are diverse in their approaches to evolving and achieving social change. Their aims and tactics differ when it comes to broadening their activities across contexts, spreading their concept, or seeking to make a bigger impact by promoting co-operation. This paper draws on three pairs of European, community-centred initiatives which reveal alternative views on scale, growth, and impact. We argue that *proliferation* – a concept that emphasises how something gets started and then travels in perhaps unexpected ways – offers an alternative to *scaling*, which we understand as the use of digital networks in a monocultural way to capture an ever-growing number of participants. Considering proliferation is, thus, a way to reorient and enrich discussions on impact, ambitions, modes of organising, and the use of collaborative technologies. In illustrating how these aspects relate in *processes of proliferation*, we offer CSCW an alternative vision of technology use and development that can help us make sense of the impact of sharing and collaborative economies, and design socio-technical infrastructures to support their flourishing.

CCS Concepts: • **Human-centered computing** → **Collaborative and social computing theory, concepts and paradigms**.

Additional Key Words and Phrases: scaling; proliferation; impact; collaborative economy; sharing economy; local initiative

ACM Reference Format:

Airi Lampinen, Ann Light, Chiara Rossitto, Anton Fedosov, Chiara Bassetti, Aniko Bernat, Penny Travlou, and Gabriela Avram. 2022. Processes of Proliferation: Impact Beyond Scaling in Sharing and Collaborative Economies. *Proc. ACM Hum.-Comput. Interact.* 6, GROUP, Article 41 (January 2022), 22 pages. <https://doi.org/10.1145/3492860>

Authors' addresses: Airi Lampinen, Stockholm University, Stockholm, Sweden, airi@dsv.su.se; Ann Light, University of Sussex, Bristol, United Kingdom, Malmö University, Malmö, Sweden, ann.light@sussex.ac.uk; Chiara Rossitto, Stockholm University, Stockholm, Sweden, chiara@dsv.su.se; Anton Fedosov, University of Zurich, Zurich, Switzerland, antonf@ifi.uzh.ch; Chiara Bassetti, University of Trento, Trento, Italy, Italian National Research Council (CNR), Rome, Italy, chiara.bassetti@unitn.it; chiara.bassetti@cnr.it; Aniko Bernat, TARKI Social Research Institute, Budapest, Hungary, bernat@tarki.hu; Penny Travlou, University of Edinburgh, Edinburgh, United Kingdom, p.travlou@ed.ac.uk; Gabriela Avram, University of Limerick, Limerick, Ireland, gabriela.avram@ul.ie.

Permission to make digital or hard copies of all or part of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. Copyrights for components of this work owned by others than the author(s) must be honored. Abstracting with credit is permitted. To copy otherwise, or republish, to post on servers or to redistribute to lists, requires prior specific permission and/or a fee. Request permissions from permissions@acm.org.

© 2022 Copyright held by the owner/author(s). Publication rights licensed to ACM.

2573-0142/2022/1-ART41 \$15.00

<https://doi.org/10.1145/3492860>

1 INTRODUCTION

Global commercial platforms, such as Airbnb and Uber, have become emblematic of the sharing economy, despite an often critical academic discourse regarding them (e.g., [19]). The propagation of these digital platforms across countries and continents has contributed to narratives that frame success as a matter of scaling, that is, attracting as many users as possible – across contexts and over time – and growing networked structures to wipe out competition. It is often these larger, ‘monotechnological’ platforms that come up in literature, rather than smaller, local platforms that (share and) borrow components from other technologies and infrastructures [10].

Alongside the contentious mainstream narrative of the sharing economy, then, there are stories to be told about *collaborative economies*, with various trajectories and forms of organising [40]. We focus on these local, collaborative initiatives that embrace different values and techniques than either the monoliths of the sharing economy or the earlier wave of networked tools that helped spawn peer production and facilitate the circulation of intangible assets. In particular, we explore how these initiatives evolve. Venture-backed platforms are geared for scalability and often required to seek growth as a condition of their funding and business models, whereas collaborative initiatives differ from one another in their ambitions regarding size, longevity, and how their ideas and practices transfer from one setting to another. Moreover, while these initiatives share a strong focus on location, they are diverse in their approaches to change. They seek impact by connecting with other actors, promoting co-operation, or even resisting escalation. Their commitments are closer to those central in core [20] or solidarity economies [41] than mainstream business.

1.1 How do location-focused collaborative economies evolve?

In the following pages, we explore how sociotechnical practices travel as (ecologies of) collaborative economies evolve. In particular, we consider this travel as *proliferation*. The concept helps us consider how local initiatives develop, morph and/or multiply over time, how ideas find their way to new contexts and how digital networks might support growth in learning. We build on the work of Light and Miskelly who talk about “*proliferating ideas and learning from others*” [36, p. 612] as part of *meshing*, that is, setting up an alternative to scaling that fosters “*mutual commitment within a neighbourhood by layering local sharing initiatives and developing and maintaining local collective agency through their aggregation*” [36, p. 613]. The notions of scaling and scalability are often used to emphasise the ability of digitally-networked projects to expand and grow without changing inherent components, thus ignoring local diversity and the heterogeneity of the world [59]. The concept of proliferation resonates with this critique. For us, proliferation encompasses diverse ways of transforming and spreading, which acknowledge the importance of context and place.

While recent work [26, 54] has drawn attention to the challenges that might arise when multifaceted, and sometimes divergent, concepts coexist within a research area, we argue that when it comes to research on collaborative economies, alternative narratives are needed to make sense of how different initiatives frame issues of growth and impact, both in relation to wider ecological systems and project-specific assessments. However, we align with these authors in rejecting the idea of “moving forward”, which is culturally backed by (or ingrained in) an ideology of “progress”, of linear development. Such an ideology, or cultural cornerstone, is a modern one, and, as such, one that serves capitalism. As with most cultural cornerstones, moreover, it is largely taken for granted and works at the tacit level. This paper hopes to reveal its working by offering *proliferation* as a concept that contests progress as a linear, unilateral, macro-level phenomenon.

We make a primarily conceptual contribution, examining how *processes of proliferation* can be attentive to the diversity of collaborative initiatives, and how they may open up alternative ideas of progress that are kinder to cultures and ecologies. In our examples, some initiatives proliferate

by sharing knowledge or coordinating activities with the help of a central organisation, while others rely on artifacts, such as freely available documentation, to help their concept or main practices spread. Yet others are content to exist for a particular period or to contend with specific challenges or contingencies, then hand on. Our argument for proliferation – as a way to reorient and enrich discussions on impact – links structure, ambitions, and the use of collaborative technologies. In showing how these structures differ, we demonstrate a range of evolving processes alive in European collaborative economies. We offer CSCW an alternative vision of technology use and development that progresses eco-social models of cohabitation, rather than single-minded growth. This necessarily puts an emphasis on place and movement between places, not as the lightning acts of software, but as the hard work of considering impact.

1.2 Beyond platform capitalism and the for-profit sharing economy

Guided by prior related research – in particular calls to explore diversity in geographic contexts [15, 58] and consider alternatives to scale and scaling [49] – we focus on three pairings of European, community-centred initiatives. With their focus on locational aspects, the initiatives we discuss manage resources beyond the well-known business models of platform capitalism and the for-profit sharing economy. When they share their structures, ways of organising, and learnings, it may be ad-hoc, but never foundational to the system. This differs from enterprises considered in the first wave of sharing economy research, which identified intangibility and infinite networked reproduction as core ingredients (e.g., [1, 45]). The location-focused initiatives which we are styling *collaborative economies*, after Avram *et al.* [3, 4], would seem to be a further type of economy to emerge from the encounter between digital networks and resource management, one where technology use is more ad-hoc but particularly implicated in how these initiatives travel.

As Benkler [5, p. 296] describes, digital (infinitely reproducible) resources and those that are “lumpy” must be managed differently, while both can “*exist alongside market mechanisms for delivering substitutable functionality*”. He points to how free software, distributed computing, ad hoc mesh wireless networks – as forms of peer production – offer “*measurably effective sharing practices*” [5, p. 276]. However, with the rise of a for-profit sharing economy based on the scaling potential, not of distributed production, but of consumption managed by distributed digital functionality, the conditions against which we set our studies are no longer ones of benign sharing economies. We offer our exploration of the more contingent sharing practices that occur between collaborative economies as a contrast to the emerging aggressive business sector that acts as a broker for goods and services [56], creating externalities such as reduction in public transport use and rising rental prices.

The projects featured here (sharing tools, circulating food, co-working, and helping refugees) are grounded by location. We have chosen European settings for two reasons: First, the authors came to write together through the *From Sharing to Caring* network¹ centered in Europe; it is the context we, collectively, know. Second, Europe offers many diverse cultures in proximity. In looking at these contexts, we describe processes of proliferation and how they unfold (1) with the help of digital and physical artefacts, (2) in more or less centralised models for coordination, and (3) in times of crisis, where external pressures issue a call to action.

Before presenting the illustrative case studies, we review prior literature on scaling, processes of growth, and change [8, 14, 38, 43], and introduce our methodological approach. We conclude by discussing what we gain from a focus on processes of proliferation (including the conflicts they may entail), how the impact of collaborative initiatives may be best understood by approaching

¹For further details about COST Action 16121 *From Sharing to Caring: Examining Socio-Technical Aspects of the Collaborative Economy*, see <http://sharingandcaring.eu/>

them as ecologies, and how supporting the spread of malleable templates for participation may be key for the flourishing of such ecologies.

2 APPROACHES TO GROWTH AND IMPACT

The question of scaling is not a new one in CSCW and HCI research. Scholars have, for instance, addressed the challenges, associated with social networking sites and big data, to manage millions of users across devices and contexts of use [13]. Often there is an unquestioned assumption that bigger is better in providing technology for societal ends. This is related to serving commercial interests, where the scale of an enterprise is linked to profit. This commercial imperative is so deeply rooted as an expectation that Martin *et al.* [39] note pressure to commercialize voluntary/not-for-profit sharing-based organizations, not least because innovation funders assume that “*all innovators within the sharing economy would be for-profit organisations seeking to establish a financially sustainable business model*” [39, p. 246]. Yet, for community-led and grassroots initiatives in the collaborative economy, growth may not be desirable or organisationally sustainable. Relatedly, research on sustainability and sustainable futures has called for alternative perspectives on impact and growth, and advocated for degrowth [27] or post-growth [22], having recognised that the major inconsistency in the UN’s Sustainable Development Goals is between economic growth and all other qualities, such as life on earth and in the water (e.g. [57]).

Resonating with this line of thinking, we ask how we might support growth in experience and learning, rather than growth as scaling networks (i.e., attracting ever larger numbers of participants), or as the replication (i.e., cloning) of services with the help of digital platforms. As Light and Miskelly [36] point out, *scalability* is enabled by software run across digital networks that has the potential to offer identical services globally. These particular spatial politics – *scaling* for maximum planetary share – come at a cultural cost, homogenising service delivery, while also removing local agency in decision-making about the design, function, and business model of these services. Over time, this erodes diversity. In the following, we introduce approaches to scaling as a background for discussing alternatives through the notion of proliferation. In so doing, we juxtapose alternative conceptualisations with prior work [8, 14, 38, 43] that has emphasised different aspects of organisational and community growth.

2.1 Patterns of upscaling

Critical to considerations of proliferation is the detail of how it occurs, not just in place, but in time. Writing in the context of smart energy grids and energy innovation policies, Naber *et al.* [43] propose a typology of four different patterns of upscaling: growing, replication, accumulation, and transformation. First, *growing* refers to a dynamic where an experiment continues and more actors participate in it, that is, the experiment grows in size and/or activity. Second, *replication* refers to what happens when “the main concept of an experiment is used in other locations”. When an experiment is replicated in other geographical locations or contexts, it is possible to use prior, local knowledge gained from the initial experiments [43]. Third, the authors use the term *accumulation* to refer to instances where an experiment gets linked to other experiments. To connect this with collaborative economies, we can think of federated models of organisation or the work that cooperative networks and umbrella organizations do to help individual co-ops learn from one another. Fourth, Naber *et al.* discuss *transformation* in the sense of an experiment shaping wider institutional change in its environment, rather than leading to geographical or physical scaling. While growing and replication, respectively, relate to an increased number of actors participating in a given initiative and reusing the same concept in different locations, accumulation and transformation indicate, instead, more qualitative changes in how different initiatives connect to each other or shape change at an institutional level.

This tidy categorisation produces a typology for strategy, but our goal here is to look closely at mechanisms and motives that allow initiatives to develop and make impact tactically, with a less formal result. And, while Naber *et al.* intend their four terms to encompass adjusting and adapting experiments to new settings, referring to that as replication risks fostering ideas of recreating something to be the same across contexts. As a case in point, grounding their discussion in the case of Hoffice – a self-organizing network experimenting with an alternative social model for flexible forms of work in private homes (for details, see [48]) – Lampinen, Rossitto, and Gradin Franzén [32] discuss the challenges of replicating the original home-based concept in other contexts, such as public libraries. Their work shows that core visions and ideas might be entirely transformed, to the extent that they become something else, when initiatives are “replicated” by – and for – third-party actors that fail (or purposefully refuse) to appropriate initiatives’ original values and motives. Replication, in the sense that Lampinen *et al.* discuss it, encompasses not only adapting technologies and practices to new settings, but also the (re)negotiation of core values.

2.2 Scaling up and scaling out

Bringing together research on design and social innovation, Manzini [38] proposes two scaling strategies: scaling up and scaling out. These strategies raise questions of how the impact of local collaborative organizations and collectives can be increased, and how they can grow over time without losing their collaborative value.

Scaling up is a strategy that deals with connecting and integrating several small collaborative projects and grassroots initiatives into larger framework programs. We can consider the Italy-born Slow Food movement [52] an illustrative example of a scaling up approach that encompasses multiple local, regional, and national initiatives in a single network. The second strategy, *scaling out*, refers to the replication of an initial concept or idea (e.g., co-housing, car sharing, community-based agriculture) while attuning it to the new context. The idea to be replicated, then, can be shaped by the particular characteristics of its promoters and, thus, influenced by different stakeholders who recognize, adapt, and localize it. Manzini proposes two main tools to realize this process. The first is a community-oriented toolkit that aims to support people’s capacity building towards recognizing and applying the collaborative organisation idea into their own contexts. We can think of the Social Street initiative as documented by Mosconi *et al.* [42] as an example, in that it relies on a step-by-step guide on how to get the initiative going in different cities. The second is a social franchising solution for promoting larger social benefits. It relies on established know-how for implementing and managing a collaborative initiative idea with the additional benefits of using an identifiable brand owing to its roots in commercial franchising. Manzini brings up Tyze.com, a web platform “that seeks to organize a help network of relatives, friends, and neighbors available to lend a hand to people in need of care”, as an example of a light social franchise.

Finally, Manzini describes the “scaling up” strategy as an enabler for transformation and change, be it locally (e.g., enhancing neighborhood, city-wide, regional programs/projects) or within larger systems (e.g., agro-food system, health care, school system). He [38, p. 180] talks of “multiplying effects”, most of which are familiar as factors of scale: that governance agents become more aware and more sympathetic to new economic structures, that people become more inclined to pay attention and use these opportunities, and so on. Here, we part company with him, hearing, in this description an existing paradigm of scaling growth, unlike Light and Miskelly [36] whose idea of meshing is a more grounded phenomenon, with a focus on growing community and solidarity in place [61]. When Light and Miskelly discuss relational assets, they refer to multiple initiatives taking off within an area and providing each other with support. Here, the diversity of the initiatives is distinct from Manzini’s considerations – even of the “connecting” strategy which allows promoting, aligning, and coordinating self-standing initiatives towards a framework of a single vision – which

do not address explicitly the question of what has or has not scaled. Is it the concept of an initiative that spreads, or the organisation itself? A key feature that Light [33, 36] points to is the need for longitudinal work to learn how initiatives flourish and change in practice.

2.3 Processes of organisational change

Within HCI, Biørn-Hansen and Håkansson [8] discuss different modes of scaling, offering three stages of scaling up – sustaining, growing, and spreading – drawing on interviews with representatives of volunteer-based, community-driven, sustainability-oriented organisations in Sweden and building on these initiatives’ aspirations regarding impact. In this work, *sustaining* relates to organising initiatives. It concerns establishing prerequisites and conditions for the other two stages, growing and spreading. Typical activities and processes of this stage include securing funding and material resources, recruiting volunteers, attracting members, as well as establishing working routines and practices that reflect core values. *Growing* is a process that actively addresses the vision of an organisation to make an impact in society through scaling their activities in a practical sense. These activities include building up new sociotechnical infrastructures (e.g., identifying collaborators, getting physical resources in place, determining and agreeing on new practices and onboarding routines) and enabling participation beyond the initial member-base. *Spreading* refers to the creation and dissemination of new skills, ideas, and knowledge. The authors do not see these processes as mutually exclusive. Rather, they can occur in parallel, or in different sequences, depending on each organisation’s needs and resources.

Similarly, the work by Bødker *et al.* [9] on community artifact ecologies addresses different phases communities go through – becoming a community, everyday community, and building anew – with a focus on how technology use supports community activities. The authors characterise building anew as a strategy for communities to grow by collaborating with local actors or tapping into existing infrastructure. They show, however, that both members’ sense of ownership and their experience of the role of the organisation might change throughout such processes (see also [34]). This resonates with Biørn-Hansen & Håkansson’s [8, p. 7] remarks: “*Transition- and sustainability-oriented values underlie most of what these organizations do and stand for, and growing puts pressure on these values. [...one organization] has developed the most advanced ideas about scaling up, but is also struggling the most with finding a model that allows staying true to their values.*”

A question remaining with the mapping of processes that Biørn-Hansen & Håkansson [8] propose is how, and how well, these three processes fit with the underlying communities – the authors’ concern is to attend to how initiatives become more than they are to begin with, not how they become something qualitatively different. This contrasts with Light and Miskelly’s analysis [35, 36] as to why some community organisations choose not to scale, yet nevertheless have influence beyond their original scope. Not every organisation needs to continue indefinitely or grow. Light [33] elaborates on this, looking explicitly at Makerhood’s² not-for-profit, shared ownership model and how it compares with an example in the commercial sharing economy. Her analysis recognises the different pressures and opportunities that the different economics afforded. Building on this prior work on proliferation, we focus on *processes* to open up room for dynamic networks of initiatives and relationships that evolve over time. Rather than looking at the life cycles of individual initiatives as isolated events, how might we better attend to how different efforts add up over time? Would this help us account for the impact of initiatives that are short-lived, more pop-up in their nature, attending to place yet not bound by it? And what tools would support this?

²<https://makerhood.home.blog/about/>

2.4 Scaling up co-design

Dearden *et al.* [14] provide a study of organisations resisting conventional scaling. This 18-month study addressed how small organisations might improve their chances of survival during recession by expanding their network in a focused way. The team initially expected that scaling, geared to improve effectiveness, would mean *extending out* (reaching more people), *extending up* (reaching policy makers), *spreading out* (cascading co-design practices), and/or *connecting* people and practices. However, on looking at the organisations' goals for scaling up, a second set of conceptions emerged. This resulted in characterising scaling up as a means for organisations to (1) address issues that could not be addressed before (or address them more holistically); (2) deliver the same or more outputs with less resource; (3) reach more people and communities; (4) cascade co-design practices to wider society; and/or (5) diversify their offering to communities. What becomes apparent from this work is that the organisations here could scale best by working with each other on matters of common interest that furthered the paired partners' goals. New offerings of this type required some extra resourcing at outset, but, when sensitive to each organisation's needs, they also achieved some or all of the ambitions listed above and ultimately provided more viability at a difficult time. The study invites us to consider how processes of proliferation might involve collaborations and entail scouting for alternative paths in pursuit of meaningful impact.

3 METHODOLOGICAL APPROACH

To unpack different processes of proliferation, we consider three pairs of cases from Europe. We look particularly at examples of collaborative economies that are wedded to place. *It matters where and by whom an initiative was created*. When it moves to another setting, it changes to meet the different context. In fact, only the blueprint travels and that is tweaked as it goes. Contrast this with a service like Airbnb where the offer from the provider trades on its consistency.

Our deliberate focus on the European context responds to calls for research that examines diverse geographic settings [58], counteracting the overemphasis on US-centered studies that have become emblematic of the sharing economy in computing literature [15]. We have paired the studies to reveal particular phenomena of interest. The local initiatives we focus on range from grassroots efforts to create co-working spaces to solidarity groups, and from food collectives to a resource sharing community, however we take a structural, as well as thematic, interest. We have chosen these cases to draw attention to differences in aspirations, practices, and models for governance that are central to how such initiatives may transfer across settings. In bringing these cases together in a re-analysis, we aim to illustrate how a focus on processes of proliferation might help us develop an alternative perspective for thinking about growth and impact in community contexts. Our contribution is primarily conceptual, rather than a novel empirical contribution in its own right.

Our case studies are drawn from prior research: the authors have previously investigated the different cases separately. The research methodologies in prior research on our selected cases draw upon qualitative approaches, including ethnography, digital document analysis, participatory [55] and contextual design [7] (see Table 1). What links all of the authors here is participation, over years, in the *From Sharing to Caring* network, and related discussions on understanding and supporting the development of collaborative economies. As part of collaborating, we used an inductive approach to pool and analyse many examples drawn from 32 countries. Of these, for this paper, we chose a selection that demonstrates what makes these small location-oriented initiatives particular, the key dimensions across which they vary, and how they differ from two well-articulated sharing economies – that of peer production, as described above (and in [5]), and that of collaborative consumption [12], caught in Gorenflo's [51] critical assessment of more recent commercial trends. These diversities lead us to talk in terms of *collaborative economies* since talking in singularities

Table 1. Overview of the research strategies and methods adopted in each case study.

Case study	Research Strategy	Methods
Pumpipumpe	Qualitative research, Participatory design	In-context interviews, co-design workshop
Hoffice	Ethnography	Interviews, participant observation, workshops
Gruppi di Acquisto Solidale	Qualitative research	Interviews, participant observation
Alveari	Qualitative research	Digital document analysis
Khora	Digital ethnography	Digital document analysis, participant observation
Migration Aid	Ethnography	Interviews, focus groups, participant observation

breaks down when looking at so many different models and approaches. This also leads us to consider the variety of ways that projects may embrace place – through co-location, distribution of tangible goods, specific political concerns, or sheer desire for neighbourliness.

Specifically for developing the argument presented in this paper, from March 2020 we repeatedly held online meetings to critically interrogate, and then select, the case studies through three key questions: (1) What facilitates the proliferation of collaborative initiatives that are not travelling as part of (would-be) global digital platforms? (2) What elements of these initiatives are moved forward and how do they travel? (3) What are the mediation mechanisms for this traveling? This led us to identify limitations in existing typologies regarding scaling and to develop a shared frame of reference for thinking in terms of processes of proliferation.

In analysing our cases, we focus on how initiatives develop, morph, and/or multiply over time, rather than how they might become more than they are through simple scaling of software access through networks. We recognise that there are several mechanisms at play in understanding spatial spreading over time. In this field – as in much of life, but particularly where communities are concerned – things are rarely tidy or clearly bounded. Reflecting these dynamics, every participating researcher had their own relationship with the study, their data, and initial findings which we reconcile in this paper. We summarise the research strategies and methods used in each case study in Table 1, before turning to the cases and our analysis of them in the next section.

4 ILLUSTRATIVE CASE STUDIES

We now examine *processes of proliferation* with the help of our illustrative case studies. The processes underway in each domain reveal different mechanisms of extending collaborative initiatives. By understanding these better, we can support the flourishing of a different set of values, growth in local management experience and knowledge, and the solidarity economies that can accompany it. In what follows, we discuss three phenomena that emerged from our initial reflection on the case studies with which we have worked – that some distributed enterprises are linked by no more than a template; that management structures may be more or less formal; and that initiatives respond to local social context. These elements may distinguish grassroots collaborative initiatives from their commercial peers. Our six studies are paired to reveal (1) how an initiative (or the idea that energises it) can spread with the help of artefacts, leaving plenty of room for reinterpretation and contextual adaption, (2) how initiatives may rely on centralised and partly vertical or decentralised and fully horizontal modes of organising and spreading, and (3) how an international crisis may spur local

communities into assembling new networks of solidarity and adapting volunteer practices to match idiosyncratic needs while drawing inspiration from shared values.

4.1 Spreading with the help of artefacts: Pumpipumpe and Hoffice

Let us consider two examples where the use of artefacts (e.g., online documentation of best practices) is central to how initiatives move beyond their original context: **Pumpipumpe**³ is a volunteer-driven sharing community that promotes the co-use and re-use of under-utilised household assets (e.g., bikes, tools, sports gear), while encouraging face-to-face encounters among neighbors [17, 18]. To start sharing items with the community, one is required to order a set of tool stickers that can be affixed to a mailbox to signal what a household is willing to share. The images on the stickers vary from common household items to rarely used kitchen appliances and leisure equipment. Pumpipumpe offers supporting digital tools, such as a map⁴ of what items are available and where, but it leaves it to members to agree on how to arrange sharing. The initiative was founded in Bern, Switzerland, in 2012 and has since attracted participation from over 24.000 households, primarily in central Europe.

The self-organising network **Hoffice** – a merger of the words home and office – brings together people who wish to co-create temporary workplaces by opening up private homes for collective use as shared offices [48]. The network was founded in Stockholm, Sweden, in 2014. Participation in Hoffice is voluntary, and the network relies on its members' efforts to organise co-working days. The Hoffice concept entails a co-working methodology which provides a rhythm for alternating silent working sessions and active social breaks. Documentation of how to run Hoffice events is available on the website of the initiative, thus allowing those interested to freely apply it in their own settings and adapt it as they wish.

At a glance, Pumpipumpe's approach to spreading is growing the number of members who intend to make some of their possessions available locally, largely in line with Manzini's [38] description of scale-by-reproduction. The sticker sets, that allow anyone to get started with sharing with those nearby, are shipped out centrally from Switzerland. They are distributed by post to either individual households, who have ordered them for their own use, or to partners/resellers (e.g., libraries, local food cooperatives) who make them available to interested individuals. This process entails little control on how new members use the stickers, and it involves no particular consideration for new contexts of participation. Fedosov *et al.* [18] have observed members' creativity and resourcefulness in adapting the stickers beyond the suggested use on mailboxes. For example, they reported that stickers were placed in various semi-private and public spaces (e.g., house doorways, lobbies) and even affixed on personal possessions (e.g., a rear door of a camping van). The appropriation of the concept to a particular context of use came from the members rather than the organisation itself. So, while there is a central, volunteer-run organisation that plays a role in how Pumpipumpe spreads nationally and internationally, the easily spreadable artifacts – the stickers – are what actually travel in the community. This expands its activities to diverse, new locations, while the central organisation does not know much about the distributed activities prompted by the stickers.

Beyond the stickers, the organisation offers participants and participating communities little advice on how to act and there is scarce direct communication between the organisation and different clusters of people using the stickers. Pumpipumpe offers scaffolding for peer-to-peer exchange but it does not try to dictate the details for any particular setting or sub-community. The smoothness with which Pumpipumpe adjusts to specific contexts can perhaps be explained

³The name Pumpipumpe stems from a delicate interplay of two German words: "eine Pumpe" that means a pump (e.g., a bike pump), and "pumpen" that means both to borrow and to lend.

⁴<https://map.pumpipumpe.ch/>

by the simplicity of how sharing is supposed to work (e.g., accessible to many; deliberate lack of specific rules and regulations when it comes to exchanges), and by the design of the stickers: The lack of rules and the textless pictograms that are intended to make the stickers universally comprehensible makes it possible to spread the idea in a way that leaves the details of the activities for those participating to figure out for themselves.

In addition to the stickers, what transfers in the case of Pumpipumpe is the concept of sharing [23, 24], including related practices that may take various forms [16], the associated neighborly values of participation, openness, solidarity, and social support, as well as ambitions for changing peoples' unsustainable consumption patterns. However, while the organisation aspires to spread its activities, there are significant difficulties in doing so beyond the microcosms of particularly active individuals and neighborhoods. Sharing may thrive in specific neighborhoods or condominiums, but Pumpipumpe members face significant barriers to getting an item from beyond their immediate vicinity or local networks, and most sharing takes place within an easy walk (similarly to [33]). This creates an interesting tension with regard to scaling. Despite supporting digital tools that facilitate searching for items (an online interactive map) and coordinating exchanges (a messaging service among members), Pumpipumpe does not explicitly offer conditions – or create incentives – for interaction between independent clusters, even if that would advance the growth of the network. The organisation seems content to let sharing flourish in small areas that do not link together.

As a co-founder sums up: “*Pumpipumpe is not a finished product but a tool to activate the [network] in the neighborhood.*” [18] The exchanges in the community are usually quite casual and involve face-to-face encounters to agree on the pick-up and return of an item. This flexibility allows the concept to travel across local, regional, and national boundaries. Nonetheless, in contrast to some initiatives with established guidelines on how to reproduce key practices in different neighborhoods (e.g., Social Street [42]), the very lack of detailed documentation and guidance within the Pumpipumpe community may hinder sharing opportunities [18]. Beyond the acquisition of stickers, members are, for instance, not instructed in how to approach neighbors or how to reason about fears of being a burden and the discomfort of feeling indebted. While the stickers may help with spreading the concept, engaging with and sustaining social interactions between new and more established members is somewhat unpredictable and idiosyncratic in each new setting.

When it comes to Hoffice, the website of the initiative⁵ provides materials that document the co-working methodology (often referred to as the structure), information about central hospitality norms (e.g., access to private areas, expectations about providing refreshments for guests, or welcoming guests in tidy apartments), and suggestions on how to set up and run Hoffice co-working days. While these resources scaffold participation in the Hoffice network in Stockholm, Sweden, they are also freely available to anyone interested. The availability of the documentation means that new networks that draw upon the ideas energising Hoffice can emerge without any particular efforts from the side of the initiative's founders. Similar to the Pumpipumpe case, this means that the network can expand and its concept travel in a bottom-up, ad-hoc fashion. As various actors can appropriate aspects of the Hoffice methodology for their own use and purposes, no centralised coordination is needed. The organisation of virtual Hoffice events (Voffice), that rely on the structure to organise co-working but replace face-to-face interactions with collaboration mediated by video conference tools, is emblematic in this regard. Anyone can adopt the concept and methodology in line with their aspirations and needs, including, for instance, meeting and working online rather than being physically co-located. Repeated conversations with one of the co-founders suggest that this type of expansion of the initiative is seen as an indicator of impact, rather than something that should be controlled centrally. Different instances of Hoffice do not

⁵<http://hoffice.nu>

need to be formally connected to one another; no central organisation oversees the spreading of the concept, or how core sociotechnical practices may be transformed as they are moved forward.

While previous work on Hoffice has illustrated the network's struggles to manage unexpectedly rapid growth and the shortcomings of thinking of scale in terms of attracting ever more members [32], here, we draw attention to the role that the online documentation serves in putting the Hoffice methodology and practices into circulation. The documentation helps the emergence of smaller, local networks within different urban areas or even across countries.

A telling example of how the Hoffice concept has been adopted in countries beyond Sweden (where it originated) is Hoffice Hertfordshire. This network was initiated in 2018, in a town located about an hour from London, UK. The founder is a "homepreneur" who, at the time, was writing a book on the challenges of homeworking and self-employment. She came across Hoffice while researching material for her book, and thought the co-working structure was not only a good example for the book, but also a practical alternative to commercial co-working spaces, where, ironically, the growing numbers of networking events can make it challenging to get work done.

Hoffice Hertfordshire illustrates several types of adaptation that can determine how collaborative initiatives diffuse across contexts and time. First, diverging from the model of Hoffice in Stockholm that relies on a Facebook group, the organising of this new network was initially coordinated through Facebook Messenger. The founder used instant messaging to arrange events, by personally inviting potential participants from within her social network. Second, more recently, we have noticed that Hoffice Hertfordshire events are now publicly advertised on a Facebook page that is administrated by the founder and has a broader focus on homeworking and self-employment. Here, a difference can be found in the founder's routines to welcome newcomers to the group and introduce them to other online members. Third, while Hoffice Stockholm is open to anyone willing to participate – from freelancers to university students and retirees – Hoffice Hertfordshire is more explicitly targeted towards homepreneurs. The organisation of co-working events is only one of the activities unfolding via the Facebook page that the founder uses extensively to announce courses and seminars and to disseminate her work. In this respect, Hoffice Hertfordshire is a part of a broader set of interests and activities.

In sum, the Pumpipumpe and Hoffice initiatives have extended their reach through modelling a new form of interaction, using stickers or a description of how to structure a co-working day, to capture and share some essence of their achievements. When we compare the instances of Hoffice in Stockholm and Hertfordshire, we see a form of proliferation that does not aim to extend an existing collaborative initiative, but rather involves the adaptation of concepts and practices across contexts. This is similar to the adaptation and appropriation evidenced in the Pumpipumpe case. Both move away from the tenet that digital platforms are the main instruments of replication or growth. Here, artefacts such as online documentation and physical stickers contribute to the visibility of a particular initiative, while leaving room for the interpretation, adaptation, and appropriation of specific practices. This is reminiscent of the telephone box micro library, described by Light and Miskelly [35, 36], that reproduces itself by publishing details of its construction on Facebook⁶.

4.2 Relying on social ties and/or digital technologies: Gruppi di Acquisto Solidale and Alveari

To further unpack different processes of proliferation, we now turn to discuss two food-related cases. Together, they illustrate how pre-existing social relationships and collective activities, along with differing engagement with digital technologies, can shape the spread of ideas and networks.

⁶<https://www.facebook.com/Lewishammicrolibrary/>

Gruppi di Acquisto Solidale (GASs)⁷ are self-organised collectives whose members periodically purchase food and other goods at wholesale prices, from small local producers, and then distribute them among members. Choosing produce in line with values such as fair-trade or solidarity between members and producers is important for GASs. Group solidarity activities often exceed ethical purchasing. Participation in GASs is voluntary, activities are run according to members' interests and availability, and decisions are made after collective discussion. Goods are collected by one or more participants and then picked up at a physical place.

The second initiative that aims at linking local food producers to local consumers, is a France-born network that takes different names in different countries. In Italy, it is known as "**L'Alveare che dice sì**", or simply **Alveari**. Each local food group of the network has a manager who collects members' orders online, manages payments, and organises weekly distribution. The core group managing the network and the platform retains a percentage of producers' revenues – 20 percent of tax-free revenues in Italy, half of which goes to the group manager. Distribution takes place face-to-face and serves as a community building occasion, for instance between consumers and producers, but encounters are usually limited to such contexts.

Although motivated by similar concerns, such as favoring local small producers, the organisational models of the two collectives, their relationships with digital technologies, and the purchasing practices that they enable differ dramatically. GASs rely heavily on co-operation and pre-existing relationships among members. The formation of new GASs and their operation largely leverages such ties. Newcomers are usually friends or acquaintances of other members or people who have been previously involved with another GAS (e.g., in different cities). GASs operate without any bespoke online platform, through already available ICTs, such as email, instant messaging, and telephones. Face-to-face communication at assemblies or other group meetings is also important to cultivate relationships and organize activities. In contrast, Alveari is organised through a bespoke, multi-language platform that (1) supports the creation and management of different food groups, that is the Alveari (Alveare is the Italian for a beehive, and Alveari its plural form); (2) helps individuals locate nearby groups through a searchable map, become members, and place orders; (3) allows producers to showcase their work and products; and (4) favors promotion of the network more generally. The digital platform is pivotal for external communication, to describe the initiative and inform people on how to join, as producers, customers, or group managers. The Alveari platform provides a model for setting up local groups independently of any direct relationship between different groups members. The platform creates a context for producers and consumers, who do not necessarily know each other, to establish new relationships and co-operation.

The structure and organisation of the Alveari network mark a significant difference from GASs, where people self-organise based on local and, sometimes, personal ties. Indeed, where GASs' internal organisation is fully horizontal, with members collectively deciding where and what to purchase, who is going to pick up the products, and how they will be distributed, each Alveare has a manager whose role is defined in the digital platform. Managers create new groups by bringing together food buyers and finding producers. Thereafter, they are responsible for regularly collecting online orders from individual members and setting up a place and time for weekly distribution. Alveari managers often own a food-related business, such as an organic-food bar or a food truck. While capitalising on peer-to-peer buying power, Alveari do not depend on direct matching between producers and consumers. The mediation of remunerated managers and their wide local networks are central to the organising of each Alveare.

⁷A literal translation from the original Italian would be "solidarity purchasing groups". GASs emerged in Italy in the mid-90s and soon spread throughout the country. In 2014, there were over 2000 groups, involving more than 400,000 people, affiliated with the national network (and not all GASs are a part of it) [21].

GASs and Alveari's different models of organising reflect on the ways the two initiatives evolve and spread. In the case of GASs, the absence of a central platform (that would define key roles and forms of participation) means that the collectives can easily diversify their key activities and engage with various forms of solidarity. Any member can propose new products or activities, and decisions are made collectively, often through an ad-hoc group chat, via a mailing list and/or in periodic assemblies. For instance, a GAS operating in an economically challenged area in Milan, Italy, has started to organise a range of activities, such as mountain walks or shared libraries, to engage local people. Moreover, supported by GAS members, who order and buy more food than they would usually consume, and by producers, who donate food, the group organises food distribution to people in need. Another GAS, operating in Rome, has created a common fund that can be used as a social safety net to support members experiencing economic problems. This dynamism and space for adaptation are largely absent in the Alveari which are principally limited to food purchasing/selling and, at best, to other food-related initiatives and events. GASs, by contrast, constitute a diverse set of collectives where relationships are tightened and community engagement is enlarged, supported by their relative autonomy and opportunity to flex.

In terms of ambitions for growth and expansion, Alveari's centralised platform model attracts new groups into a growing network where local nodes are paramount to the exchange of food items. The design of the bespoke platform provides a clear structure to replicate, highlighting the different roles the network relies on for its organising. What spreads is an easy-to-adopt, standardised model for organising and managing local food communities, with a largely individual point of entry.

Looking closely at the values each initiative promotes, we see that the main Alveari narratives are centered on consuming healthy, seasonal produce, supporting local agriculture, and contributing to local economic and environmental sustainability. A GAS, instead, can be an activist group concerned with food issues along with other concerns (e.g., poverty). While values such as sustainability and health are relevant, GASs' chief narratives revolve around solidarity, and spread by word-of-mouth among like-minded people. In other words, what allows GAS groups to proliferate is a diffused cultural milieu – and the opportunities for interaction it provides – rather than “a coordinating queen bee”. Both offer alternative structures for purchasing food and both are more community-oriented than many other shopping alternatives. The Alveari platform serves these aims by promoting individual interests and supporting individual participation, while GASs center on social relationships and solidarity. With or without digital tools, both processes have been successful in terms of what members consider to be appropriate expansion and learning.

4.3 Assembling networks and adapting practices in times of crisis: Khora and Migration Aid

Last, we discuss two highly responsive community initiatives promoting solidarity towards migrants, including asylum-seekers, refugees, and displaced people, and undertaking street-level practices to support them with essential goods, facilities, and/or services. We bring them up as an example of how external pressures can spur the proliferation of collaborative initiatives, encouraging the formation of new networks, and prompting existing groupings to extend or reconfigure their efforts. Here, the initiatives' activities are a direct response to the refugee crisis in Europe since 2015: both emerged spontaneously (from scratch or by shifting the activity of an already established civil organisation to a new target group): **Khora** is an association of spaces and facilities supporting displaced people in Athens, Greece. Since its creation in 2016, it has been growing in terms of activities, spaces, volunteers, and target groups. In the wake of the refugee crisis in Greece, it shifted its aid activity to focus on helping refugees. **Migration Aid** is a Hungarian initiative that got started in 2015 as a rapidly expanding horizontal network of local refugee help grassroots efforts. In terms of digital tools for organising, Migration Aid and Khora both rely on commonly

available social media, predominantly Facebook, for their daily operations and awareness raising. These initiatives responded to the unmet needs of migrants and refugees arriving in Europe during the so-called “long summer of migration” in 2015. A responsiveness to emerging needs as well as flat, non-hierarchical governance structures allowed these initiatives to adapt promptly in evolving circumstances while holding on to their core goals and values, working to improve the situation of the most vulnerable, at least in the short-run.

The Hungarian Migration Aid emerged as a rapidly growing horizontal network that linked together local refugee help groups in 2015. Initially, it focused on helping refugees in Hungary. It started to operate in a number of locations within the country by establishing partly independent groups linked to major train stations, formed with the help of Facebook groups. Train stations are typical meeting points of refugees and aid providers, so organising local groups around particular stations served to structure volunteer efforts in a logistically sensible manner. The Migration Aid initiative grew up without support from any established organisations (e.g. charities, NGOs, church, municipality or state), relying in its activities solely on volunteer work and donations. Over time, Migration Aid modified and decreased its activities in Hungary, and partly shifted them towards other countries (e.g. Croatia, Greece), as Hungarian national policies shut borders and forced the migration flow to bypass the country. Migration Aid also expanded its activity to support local poor people in Hungary. More recently, Migration Aid’s activity gradually faded out and finally ceased, reflecting a lack of support and a hostile political climate, but also a changed context where the immediate needs of refugees were not so visible. In terms of impact beyond direct action, Migration Aid had influence on social attitudes at a local and national level. It played a role in shaping the institutional and organisational landscape of humanitarian aid provision by taking over activities and responsibilities that are usually dominated by established actors like the state, municipalities, international organisations, churches, charities, and NGOs. Migration Aid was a successful part of generating refugee solidarity and an example of an initiative that responded fast and with continuing flexibility to local social and political circumstances.

Our second example, Khora – an association that supports displaced people in Greece – shifted its aid activity to focus on helping refugees in the wake of the refugee crisis. Like Migration Aid, it adapted very flexibly, albeit as a pre-existing initiative pivoting its efforts in response to an emerging crisis. Moreover, while Khora shared with Migration Aid the mission of promoting solidarity in action, its trajectory has been different, in part, because it has been operating in a relatively welcoming and supportive atmosphere (a setting that has transitioned from a short-term transit country to a longer-term host for refugees). Since 2016, Khora has been growing and expanding, while changing its physical location a few times, starting from the island of Lesbos and arriving in a building with activity spaces in Athens via two other islands, Idomeni and Pireus. The community has extended its ambition “*to create community spaces and facilitate the provision of services for people forced from their homes by poverty, oppression, climate change and war*”⁸. Most recently, it was supporting those facing the negative economic and/or social consequences of the COVID-19 pandemic.

Both Migration Aid and Khora use mainstream social media. Internally, Facebook was the core platform for establishing their closed groups of independent volunteers. These groups have had a central role in sharing information, developing contacts, organising activities, and managing donations. As a flexible and easy-to-join platform, Facebook has provided a basis for both growing groups and proliferating solidarity activities. It has also allowed the initiatives to welcome diverse engagement, ranging from “arm chair activity”, such as liking, commenting, or sharing community-related posts to highly committed, day-and-night volunteering. Externally, the groups’ public

⁸<https://www.khora-athens.org/about>

Facebook pages have served as representation and awareness-raising channels to inform and influence a wider interested audience. These initiatives operate with a flat organisational model and a low level of hierarchy, applying flexible rules and protocols to adapt to the changing external circumstances as well as to the internal fluctuation of capacities. This makes them highly effective in ways that cannot be accomplished by established NGOs and charities, which lack nimbleness.

Migration Aid and Khora illustrate how solidarity activities can evolve in directions that people were not anticipating – over time, initiatives emerged as needs emerged and transformed in line with changing circumstances. Recent research in crisis informatics (e.g., [2, 28, 50, 60]) documents and discusses in a similar vein how external pressures, such as natural disasters, can lead to the emergence of new caring initiatives and assemble new solidarity networks on the ground, as a necessary response to emergency. This brings up important questions related to the process-nature of proliferation, challenging expectations of stable longevity and highlighting rhythms of intense activity and hibernation periods. The two initiatives we have discussed represent different lifespans of initiatives in the refugee solidarity grassroots and how their work may live on. Khora is still responding to changed policies in overseeing migration attempts on the Mediterranean Sea. Migration Aid has left a legacy of resistance to a regime that became famous for its hostility to refugees.

5 DISCUSSION

In the sections above, we have discussed the extension strategies of six local and location-oriented initiatives to question the rhetoric of growth in sharing and collaborative economies. *But why is it important for CSCW research to consider the proliferation of diverse, small initiatives that appear and disappear on the fringes?* After all, there is a dominant model of scaling digital services which is proving commercially advantageous for a number of high value platforms, and which brings about opportunities and implications that have captured the attention of researchers focused on social and collaborative computing (see, for example, [25, 30, 37, 44]). If digital networks enable one thing, it is the scalability of software into worldwide monopolies. Yet, just as the refugee solidarity groups sometimes chose to work in opposition to their government’s policies on immigration, we are studying alternative views on scale, impact, and growth – and the uses of the digital therein – exactly because the practices of locally oriented collaborative economies do not conform to the dominant models of success in the sharing economy, either in production or, commercially, in consumption. Through the pairing of case studies, we have illustrated the varied proliferation processes that different organisational structures enable and emanate from. From achieving rhizome-like spreading of initiatives, through the sharing of blueprints, stickers, or other artifacts, to organising new groups through a central platform, what becomes visible is the heterodox and diverse nature of the organisational types, goals, and impacts that characterise collaborative economies.

5.1 Processes of proliferation

We have compared European initiatives that all value solidarity and the power of place to foster community, in contrast to an underlying profit motive. Yet even so, there is no single structure that unites these initiatives. They do not flourish and grow in the same way. There are many processes of making relevant. To write these out of our accounts, so as to create either typologies or standard designs, would be to stifle a creative aspect of these collaborative economies.

Manzini [38], like Naber *et al.*[43], talks in terms of “replication”, yet says “*every replica is also a design of a new and locally appropriate solution*” and “[t]he replica is always an adaptation to new circumstances” [38, p. 179]. Both Botero *et al.* [11] and Manzini [38, p. 180] agree with us that – as Manzini puts it – “*the collaborative organization [...] cannot itself be reproduced, because it is so deeply rooted in a specific context and largely shaped by the characteristics of its promoters.*” However,

we find the emphasis on consistency, inherent in “replication”, distracting. We point, instead, to the creative actions and informal design efforts that take place in the transitions between sites. This is why we find Light and Miskelly’s [36] description of “*how ideas jump between contexts and proliferate*” an appealing way to approach the trajectories and impact of local initiatives, not just individually but in terms of how they relate to each other. As a complement and alternative to approaches focused on scaling [8, 14, 38, 43], a focus on processes of proliferation makes room for noticing dynamic networks of initiatives and relationships that evolve over time. This allows research to stay truer to the rhythms and forms of engagement that shape how local initiatives evolve.

The cases of purchasing groups (GASs) and the Alveari food network highlight the importance of relationships and cultural milieu in initiatives’ trajectories, and the processes through which they may spread. How participation begins – whether through an individual or a collective point of entry – influences both members’ orientation and the proliferation process, which may happen via personal contacts, word of mouth, or through a centralised digital space that provides a more clear-cut template for organising. Initiatives like GASs, or Hoffice, require participants to put in the labor of building relationships, while others, like Alveari, are more oriented toward efficient organising. While the intention to invest in relationships may not be present from the beginning, there is a processual aspect to participation in community networks that may lead even those who were initially not looking for social ties to benefit from the relational assets that accumulate over time [31, 36]. It is the development of these relationships, and the ways in which central values are moved forward, that connect processes of proliferation to views of impact that emphasise transformation and adaptation as key to understanding the success of local initiatives [46].

Our examples of refugee solidarity groups highlight how contingencies, such as natural, political, and/or economic crises, can spur, shape, and sometimes stall, community initiatives. Alongside the refugee crisis, the COVID-19 pandemic is another example of how evolving circumstances can reshape activities and neighborhoods in drastic ways. Resources are mobilised in different ways at times of a crisis. New forms of expressing or practising solidarity and care can emerge. Watching global, profit-centred exchange platforms struggle to respond appropriately to crises (whether defined ethically or in terms of good PR), such as Uber’s automatic surge pricing⁹, reminds us how much is to be gained from having small, semi-autonomous, hyperlocal initiatives led by volunteers offering an alternative model of engagement. This, we argue, also reminds us of the need for alternative conceptualisations that can help make sense of how these initiatives seek to broaden their activities, have local impact, and co-operate within broader socio-cultural contexts. Whereas Naber *et al.* [43] suggest that scale and impact are achieved through systemic integration of sociotechnical interventions, our cases highlight different mechanisms to provide a social good, and do so in ways that are robust as ecologies of participation and care, rather than monocultures of growth. Much of this hinges on the importance of social values, relational infrastructures, and the desire to see different forms of solidarity spread. This is opposed to the spread of use, which would be more relevant in profit-centred contexts [6] or the peer production of virtual resources, such as co-created software [5]. As Manzini [38] notes, the beauty of the work is that it can be intensely local and look no further than its immediate members for influence. It can last till its job is done, with no expectation of endurance and no consequences in wrapping up. As the GAS case illustrates, groups also change their identity and focus as needed, not to survive in the marketplace, but as they respond to perceptions of interest and needs from their constituents or local communities.

⁹<https://www.forbes.com/sites/blakemorgan/2016/10/03/why-surge-pricing-during-a-crisis-is-bad-for-ubers-brand/>

5.2 Transformations and conflicts

While the cases we have discussed may seem harmonious, where people strive to collaborate, there are always tensions and conflicts to reckon with. As initiatives evolve and proliferate, power differentials, differences in ideological commitments, and differing views on effective policy may arise. As the cases of Pumpipumpe's stickers and the documentation of Hoffice illustrate, artefacts can allow new clusters of activity to emerge – without having to start from scratch – while leaving room for interpretive and contextual flexibility. The flexibility also means that concepts for collaborative initiatives can transform as they travel to new communities and get taken up in different settings and geographies. This has been visible for example in the process of setting up Boffice – Hoffice events at a library rather than in private homes – where the co-working methodology was set aside and the activities evolved such that they no longer resembled typical Hoffice events [32]. Adapting sociotechnical practices across contexts requires openness and flexibility for (re)interpretation. While it was not the case here, uncoordinated transformations can create conflict regarding who owns (the concept of) a collaborative initiative and what changes are allowed before an initiative needs to be considered as having become something else entirely.

Our analysis is not focused on conflicts, but the processes we identify do not exclude them. On the contrary, the local adaptations that sometimes transform initiatives beyond recognition are at the heart of what makes processes of proliferation interesting. In the case of Boffice, the activities transformed over time to the extent that the co-founder chose to withdraw his participation since the outcome no longer resonated with his vision and objectives [32]. Especially where no centralised platform is in place to hold different nodes together and compliant to a shared template, initiatives may connect to one another more or less loosely. Sometimes this results in conflicts, hurt feelings, or debate over who “owns” an initiative. In other cases, the early initiators may, instead, be neutral or even delighted when others take on what they have created and make it their own.

Understanding processes of proliferation can be productive well beyond the domain of sharing and collaborative economies. We have chosen to show the range of structural and stylistic differences in this sector, in part, because the pattern of ad-hoc and disorderly creativity that is so vividly present here is true of the voluntary sector(s) more broadly. Other civic initiatives share a similar embrace of tools and mechanisms for increasing their mission's reach, without always aiming at expansion. Echoing recent research [46], thinking with the notion of proliferation brings out an important point regarding impact: it is not merely related to the workings of single initiatives, but to how ideas, values, practices, and modes of participation are put into circulation and diffused across contexts.

5.3 Ecologies of collaborative initiatives

In all of our cases, actors value processes that create solidarity and harness the power of communities to come together and achieve more through aggregation and communal self-care. Even with this commonality, they go about achieving it in different ways, to different ends, despite seemingly similar goals (e.g., buying local food). Each initiative has found its own way to organise an alternative social and economic system. The forms of organisation reflect political aspirations and eventualities as well as goals of sharing. This invites us to be mindful that we can “*design a different way of considering resourcing and, with it, different economic behavior in our societies*” [33, p. 118]. But, while CSCW researchers and practitioners may find something here to apply to future designs, most of these systems were not ‘designed’ as such. Rather, they emerged as people identified how existing sociotechnical systems could be adjusted to meet local needs.

The diversity of how and why collaborative initiatives come into being and proliferate also relates to the usefulness of attending to them as clusters or ecologies: initiatives may relate to each

other, and whether an initiative grows as a self-standing entity or proliferates as different groupings has implications for the resulting collaborative activities. For example, while the Pumpipumpe community is seemingly all part of one big initiative – all using the same stickers and having access to the same online tools – the practices on the ground in different local clusters may vary greatly. This brings us back to the work of challenging scalable platforms – not everything is or needs to be formed to fit the scalable model they manifest.

As Light [33, p. 117] points out, “*while every platform exists within the global financial regime, not every platform orientates by aligning with it; some are deliberately designed to nurture types of microeconomy based in social exchange, care and recognition of voluntary labor [and] to stay responsive to context*”. A key feature is the local and accessible nature of such platforms’ management systems: the platform may be run collectively to some degree and the sharing may exist at an organisational level, producing an ecology of small projects [33, p. 118]. Light goes on to argue that building “*(digital) platforms, such as improved management systems, to help create these ecologies would be to design a different way of considering resourcing and, with it, different economic behavior in our societies*”. So, despite recognising that it is difficult to justify effort in software and networks for these varied, possibly short-lived and community-facing enterprises by using growth-oriented economic models and venture-capital fueled ideologies, we see value to society in the learning that takes place in and between these contexts. If we are concerned to make life richer, more fulfilling, and more eco-socially viable, then attending to the needs of these ecologies and providing building blocks for digital support is a way of making the worlds we want to live in.

5.4 Templates for participation

Scaling principally benefits those who control a single structure (e.g., founders, shareholders), while flattening differences between locations and seeking to undermine rivals. Proliferation offers knowledge through experience freely in patterns of learning that respect the subtleties of place and eschew monocultures for structural and conceptual diversity. From the perspective of seeking to design to support such collective initiatives, though, their diversity of goal, process, lifespan, reach, and structure may be off-putting. It seems there is no single characteristic that would make investment in infrastructure worthwhile across such differences, especially in a context where there is very little money for development. In line with what has been noted in prior research on a variety of collaborative activities, ranging from local initiatives [9, 29, 42] to large-scale online collaborations [5, 53], the outfits we looked at were already using freely available digital tools and platforms, appropriating technologies with global reach to serve local ends. *In that case, what can we learn about CSCW and what the digital does and can do?*

In the case of Pumpipumpe, the concept of neighborly sharing is promoted with the help of a material resource (that is, the stickers), but in many other cases the focus is on sharing knowledge and templates for activities. CSCW researchers and practitioners working on future initiatives might learn from this to look for the material forms that best enable ideas to travel. Hoffice published a list of best practices to better co-create a supportive working environment. Pumpipumpe used mailbox stickers as a communication interface to signify shared values of social support, care, and participation to neighbors and passers-by [18]. The tools could be digital or carried by digital means. What we see here is the simplest forms of template for promulgation. Thinking in terms of these units, how they might be aggregated and supported is one basis on which we might use technology to foster collaborative initiatives, but it is not as simple as reproducing the organisation or its structure. It requires some sensitive drawing out of what is valued and how to support its dissemination without reducing its interpretive flexibility through its encounter with technology.

In early sharing economy research, sharing and collaborative economies were tightly bundled with platforms, even though digital technologies are rarely the driving force of locally oriented

collaborative initiatives. Yet, digital platforms like Facebook or simple technical solutions, such as a basic website, can play a key role in allowing people to learn from the efforts of other initiatives, even across great distances and sometimes without personal contact. Even where collaborative initiatives may have only limited needs for digital technology locally, their digital presence on popular platforms can become valuable in terms of how others may find out about new initiatives and use them as examples and templates for events and initiatives of their own. This fuels the proliferation of an idea or practice into new contexts and geographies. Although we did not see this in action, network technology also provides potential for federating organisations to take support from each other, and/or collecting examples of related activity to help others learn from successful structures. While this is something that, for instance, the cooperative movement promotes [31], it takes a particular interest and level of resourcing to step outside the work of the moment to record and share what has worked. Voluntary organisations are often, therefore, short on documentation and connections to others. (Indeed, it is partly in this spirit that we have spent time to understand how the needs and processes of such initiatives differ from initiatives which are documented as successful business models.) That said, documenting collaborative practices online allows even locally focused initiatives with a seemingly low level of institutionalisation or technical capacity to support others' learning and spark the creation of something that is locally relevant elsewhere.

A focus on processes of proliferation invites shifting analytical and design concerns from centralised platforms towards unplatformed design [29] and the artifact ecologies [9, 47] that collaborative initiatives rely on over time. We note an irony in that initiatives which themselves resist scaling rely on and benefit from scalable systems like Facebook. These scalable systems may come and go as platforms in the life of local initiatives or even provide the mainstay. Proliferation, then, is not a 'pure' alternative to scaling even while it challenges the dominant logic of the social web.

Finally, digital platforms can help structure the organisational elements of assembling and running a collaborative initiative more directly, too. In our Alveari food network example, the centralised platform model attracts new groups into a growing network where local nodes are paramount to the exchange of food items. The design of the bespoke platform provides a clear structure to replicate, highlighting the different roles the network relies on for its organising. What is spread and supported is an easy-to-adopt, standardised model for organising and managing local food communities, with a largely individual point of entry. An Alveare's manager plays a key role in setting up a new group and engaging with the ground work of developing the social assets needed for its sustenance. Here, we see some of the scalable elements often attributed to digital platforms, yet in a setting where the platform is tasked to support value-based community activities rather than a mainstream market solution.

6 CONCLUSION

Juxtaposing prior literature that proposes typologies of scale and maps out processes of growth and change [8, 14, 38, 43], we argue for attending to the diverse ways of spreading ideas and making impact as *processes of proliferation*. We pay attention to how change happens over time and within ecologies of collaborative initiatives in our analysis of three pairings of illustrative case studies from Europe. Instead of focusing on growth, we ask what travels when local and location-oriented initiatives move beyond their original scope. We have learnt about this by unpacking processes of proliferation to see how they unfold (1) through the circulation of digital and physical artefacts, (2) with the help of interpersonal encounters and more or less centralised models for coordination, and (3) in times of crisis where external pressures issue a call to action. Initiatives can widen benign sharing practices, not necessarily by extending the reach of individual groups and their activities, but by extending the structures that can be exported and the ideas for engagement that could encourage others. By highlighting the diversity of local initiatives in terms of their relationships

with digital technologies and the processes of proliferation that are relevant for them, we can better support the flourishing of different sets of values and the economies that can accompany them. Beyond the domain of sharing and collaborative economies, a focus on processes of proliferation may help CSCW scholars better attend to the impact of civic and member-driven efforts more broadly as well as to challenge currently dominant visions of social computing.

ACKNOWLEDGEMENTS

This work was supported by the COST Action CA16121 From Sharing to Caring, the Swedish Research Council grant No. 2017-05382_3, and Forschungskredit of the University of Zurich grant No. FK-20-021. The authors thank all members of the Action's Working Group 1 for their contributions to the ideas synthesised in this paper. The authors would also like to thank the anonymous reviewers for their valuable comments and suggestions. Part of the research on GASs was conducted within the PIE News/Commonfare project, funded by the European Commission (GA No. 687922).

REFERENCES

- [1] Philippe Aigrain. 2012. *Sharing: Culture and the economy in the internet age*. Amsterdam University Press.
- [2] Daniel Auferbauer and Hilda Tellioglu. 2019. Socio-Technical Dynamics: Cooperation of Emergent and Established Organisations in Crises and Disasters. In *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems* (Glasgow, UK) (CHI '19). Association for Computing Machinery, New York, NY, USA, 1–13. <https://doi.org/10.1145/3290605.3300448>
- [3] Gabriela Avram, Jaz Hee-jeong Choi, Stefano De Paoli, Ann Light, Peter Lyle, and Maurizio Teli. 2017. Collaborative economies: From sharing to caring. In *Proceedings of the 8th International Conference on Communities and Technologies*. 305–307.
- [4] Gabriela Avram, Jaz Hee jeong Choi, Stefano De Paoli, Ann Light, Peter Lyle, and Maurizio Teli. 2019. Repositioning CoDesign in the age of platform capitalism: from sharing to caring. *CoDesign* 15, 3 (2019), 185–191. <https://doi.org/10.1080/15710882.2019.1638063>
- [5] Yochai Benkler. 2004. Sharing Nicely: On Shareable Goods and the Emergence of Sharing as a Modality of Economic Production. *The Yale Law Journal* 114, 2 (2004), 273–358. <https://doi.org/10.2307/4135731>
- [6] Lauren Berlant. 2016. The commons: Infrastructures for troubling times. *Environment and Planning D: Society and Space* 34, 3 (2016), 393–419.
- [7] Hugh Beyer and Karen Holtzblatt. 1999. Contextual design. *interactions* 6, 1 (1999), 32–42.
- [8] Aksel Björn-Hansen and Maria Håkansson. 2018. Building Momentum: Scaling up Change in Community Organizations. In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems*. 1–13.
- [9] Susanne Bødker, Henrik Korsgaard, and Joanna Saad-Sulonen. 2016. 'A Farmer, a Place and at least 20 Members' The Development of Artifact Ecologies in Volunteer-based Communities. In *Proceedings of the 19th ACM Conference on Computer-Supported Cooperative Work & Social Computing*. 1142–1156.
- [10] Susanne Bødker, Myriam Lewkowicz, and Alexander Boden. 2020. What's in a word? Platforms Supporting the Platform Economy. In *Proceedings of the 11th Nordic Conference on Human-Computer Interaction: Shaping Experiences, Shaping Society*. 1–10.
- [11] Andrea Botero, Ann Light, Lone Malmberg, Sanna Marttila, Mariana Salgado, and Joanna Saad-Sulonen. 2016. Becoming Smart Citizens: How Replicable Ideas Jump. In *Workshop at the Design and the City conference, Amsterdam*. <https://designandthecity.eu/programme/workshop/becoming-smart-citizens-how-replicable-ideas-jump>
- [12] Rachel Botsman and Roo Rogers. 2010. What's mine is yours. *The rise of collaborative consumption* (2010).
- [13] Barry Brown, Susanne Bødker, and Kristina Höök. 2017. Does HCI scale? Scale hacking and the relevance of HCI. *interactions* 24, 5 (2017), 28–33.
- [14] Andy Dearden, Ann Light, Theodore Zamenopoulos, Paula Graham, Emma Plouviez, and Sophia de Sousa. 2014. Scaling up co-design: research projects as design things. In *Proceedings of the 13th Participatory Design Conference: Short Papers, Industry Cases, Workshop Descriptions, Doctoral Consortium papers, and Keynote abstracts-Volume 2*. 67–70.
- [15] Tawanna R. Dillahunt, Xinyi Wang, Earnest Wheeler, Hao Fei Cheng, Brent Hecht, and Haiyi Zhu. 2017. The Sharing Economy in Computing: A Systematic Literature Review. *Proc. ACM Hum.-Comput. Interact.* 1, CSCW, Article 38 (Dec. 2017), 26 pages. <https://doi.org/10.1145/3134673>
- [16] Anton Fedosov. 2020. *Supporting the Design of Technology-Mediated Sharing Practices*. Carl Grossmann Verlag. <https://doi.org/10.24921/2020.94115943>

- [17] Anton Fedosov, Mervin Cheok, and Elaine M. Huang. 2021. Designing for Local Economies of Personal Artifacts. In *Proceedings of 19th European Conference on Computer-Supported Cooperative Work*. European Society for Socially Embedded Technologies (EUSSET). https://doi.org/10.18420/ecscw2021_p06
- [18] Anton Fedosov, Airi Lampinen, William Odom, and Elaine M. Huang. 2021. A Dozen Stickers on a Mailbox: Physical Encounters and Digital Interactions in a Local Sharing Community. *Proc. ACM Hum.-Comput. Interact.* 4, CSCW3, Article 240 (Jan. 2021), 23 pages. <https://doi.org/10.1145/3432939>
- [19] Koen Frenken and Juliet Schor. 2017. Putting the sharing economy into perspective. *Environmental Innovation and Societal Transitions* 23 (2017), 3–10. <https://doi.org/10.1016/j.eist.2017.01.003>
- [20] Neva Goodwin. 2018. There is more than one economy. *Real-World Economics Review* 84 (2018), 16–35.
- [21] BIN ITALIA. 2017. Research Report 2.1. PIE News – Poverty, Income, and Employment News (H2020-ICT-2015). University of Trento, Basic Income Network Italy, Centre for Peace Studies, Museu da Crise (Daniela Paes Leão and Merel Willemsen), CREATE-NET, Stichting Dyne. org, Abertay University, Madeira Interactive Technologies Institute (3 2017).
- [22] Tim Jackson. 2021. *Post Growth: Life after Capitalism*. John Wiley & Sons.
- [23] Nicholas A John. 2017. *The age of sharing*. John Wiley & Sons.
- [24] Jenny Kennedy. 2016. Conceptual boundaries of sharing. *Information, Communication & Society* 19, 4 (2016), 461–474.
- [25] Maximilian Klein, Jinhao Zhao, Jiajun Ni, Isaac Johnson, Benjamin Mako Hill, and Haiyi Zhu. 2017. Quality Standards, Service Orientation, and Power in Airbnb and Couchsurfing. *Proceedings of the ACM on Human-Computer Interaction* 1, CSCW (2017), 1–21.
- [26] Bran Knowles, Oliver Bates, and Maria Håkansson. 2018. This changes sustainable hci. In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems*. 1–12.
- [27] Max Koch. 2015. Climate change, capitalism and degrowth trajectories to a global steady-state economy. *International Critical Thought* 5, 4 (2015), 439–452.
- [28] Martin Kornberger, Stephan Leixnering, Renate E. Meyer, and Markus A. Höllerer. 2018. Rethinking the Sharing Economy: The Nature and Organization of Sharing in the 2015 Refugee Crisis. *Academy of Management Discoveries* 4, 3 (2018), 314–335. <https://doi.org/10.5465/amd.2016.0138>
- [29] Daniel Lambton-Howard, Patrick Olivier, Vasilis Vlachokyriakos, Hanna Celina, and Ahmed Kharrufa. 2020. Unplatformed Design: A Model for Appropriating Social Media Technologies for Coordinated Participation. In *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems* (Honolulu, HI, USA) (CHI '20). Association for Computing Machinery, New York, NY, USA, 1–13. <https://doi.org/10.1145/3313831.3376179>
- [30] Airi Lampinen and Coye Cheshire. 2016. Hosting via Airbnb: Motivations and financial assurances in monetized network hospitality. In *Proceedings of the 2016 CHI conference on human factors in computing systems*. 1669–1680.
- [31] Airi Lampinen, Moira McGregor, Rob Comber, and Barry Brown. 2018. Member-Owned Alternatives: Exploring Participatory Forms of Organising with Cooperatives. *Proceedings of the ACM on Human-Computer Interaction* 2, CSCW (2018), 1–19.
- [32] Airi Lampinen, Chiara Rossitto, and Christofer Gradin Franzén. 2019. Scaling Out, Scaling Down: Reconsidering growth in grassroots initiatives. In *Ethnographies of Collaborative Economies Conference Proceedings* (Edinburgh, UK).
- [33] Ann Light. 2019. Designing the economics of the sharing economy: towards sustainable management. In *Handbook of the Sharing Economy*. Edward Elgar Publishing.
- [34] Ann Light, Katie J Hill, Nicolai Brodersen Hansen, Fiona Hackney, Kim Halskov, and Peter Dalsgaard. 2013. Exploring the dynamics of ownership in community-oriented design projects. In *Proceedings of the 6th International Conference on Communities and Technologies*. 90–99.
- [35] Ann Light and Clodagh Miskelly. 2014. Design for sharing. *Northumbria University/The Sustainable Society Network* (2014).
- [36] Ann Light and Clodagh Miskelly. 2019. Platforms, scales and networks: meshing a local sustainable sharing economy. *Computer Supported Cooperative Work (CSCW)* 28, 3-4 (2019), 591–626.
- [37] Christoph Lutz, Gemma Newlands, and Christian Fieseler. 2018. Emotional labor in the sharing economy. In *Proceedings of the 51st Hawaii international conference on system sciences*.
- [38] Ezio Manzini. 2015. *Design, When Everybody Designs: An Introduction to Design for Social Innovation*. MIT press.
- [39] Chris J. Martin, Paul Upham, and Leslie Budd. 2015. Commercial orientation in grassroots social innovation: Insights from the sharing economy. *Ecological Economics* 118 (2015), 240–251. <https://doi.org/10.1016/j.ecolecon.2015.08.001>
- [40] Indre Maurer, Johanna Mair, and Achim Oberg. 2020. Variety and Trajectories of New Forms of Organizing in the Sharing Economy: A Research Agenda. In *Theorizing the Sharing Economy: Variety and Trajectories of New Forms of Organizing*, Indre Maurer, Johanna Mair, and Achim Oberg (Eds.). Research in the Sociology of Organizations, Vol. 66. Emerald Publishing Limited, 1–23. <https://doi.org/10.1108/S0733-558X2020000066002>
- [41] Ethan Miller. 2010. Solidarity economy: Key concepts and issues. *Solidarity economy I: Building alternatives for people and planet* (2010), 25–41.

- [42] Gaia Mosconi, Matthias Korn, Christian Reuter, Peter Tolmie, Maurizio Teli, and Volkmar Pipek. 2017. From facebook to the neighbourhood: Infrastructuring of hybrid community engagement. *Computer Supported Cooperative Work (CSCW)* 26, 4-6 (2017), 959–1003.
- [43] Rolf Naber, Rob Raven, Matthijs Kouw, and Ton Dassen. 2017. Scaling up sustainable energy innovations. *Energy Policy* 110 (2017), 342–354.
- [44] Noopur Raval and Paul Dourish. 2016. Standing Out from the Crowd: Emotional Labor, Body Labor, and Temporal Labor in Ridesharing. In *Proceedings of the 19th ACM Conference on Computer-Supported Cooperative Work 'I&' Social Computing* (San Francisco, California, USA) (CSCW '16). Association for Computing Machinery, New York, NY, USA, 97–107. <https://doi.org/10.1145/2818048.2820026>
- [45] Jeremy Rifkin. 2014. *The zero marginal cost society: The internet of things, the collaborative commons, and the eclipse of capitalism*. St. Martin's Press.
- [46] Chiara Rossitto. 2021. Political Ecologies of Participation: Reflecting on the Long-term Impact of Civic Projects. *Proceedings of the ACM on Human-Computer Interaction* 5, CSCW1 (2021), 1–27.
- [47] Chiara Rossitto, Cristian Bogdan, and Kerstin Severinson-Eklundh. 2014. Understanding constellations of technologies in use in a collaborative nomadic setting. *Computer Supported Cooperative Work (CSCW)* 23, 2 (2014), 137–161.
- [48] Chiara Rossitto and Airi Lampinen. 2018. Co-creating the Workplace: Participatory efforts to enable individual work at the Hoffice. *Computer Supported Cooperative Work (CSCW)* 27, 3-6 (2018), 947–982.
- [49] Chiara Rossitto, Airi Lampinen, Susanne Bødker, Ann Light, Kette Berns, and Julie Hui. 2020. Reconsidering Scale and Scaling in CSCW Research. In *Conference Companion Publication of the 2020 on Computer Supported Cooperative Work and Social Computing*, 493–501.
- [50] Hamed Seddighi and Hossein Baharmand. 2020. Exploring the role of the sharing economy in disasters management. *Technology in Society* 63 (2020), 101363. <https://doi.org/10.1016/j.techsoc.2020.101363>
- [51] Shareable. 2018. *Sharing Cities: Activating the Urban Commons*. Shareable. <https://www.shareable.net/sharing-cities/>
- [52] Sarah Sharma. 2014. *In the meantime: Temporality and cultural politics*. Duke University Press.
- [53] Clay Shirky. 2008. *Here comes everybody: The power of organizing without organizations*. Penguin.
- [54] M Six Silberman, Lisa Nathan, Bran Knowles, Roy Bendor, Adrian Clear, Maria Håkansson, Tawanna Dillahunt, and Jennifer Mankoff. 2014. Next steps for sustainable HCI. *interactions* 21, 5 (2014), 66–69.
- [55] Jesper Simonsen and Toni Robertson. 2012. *Routledge international handbook of participatory design*. Routledge.
- [56] Tom Slee. 2017. *What's yours is mine: Against the sharing economy*. Or Books.
- [57] Viktoria Spaiser, Shyam Ranganathan, Ranjula Bali Swain, and David J. T. Sumpter. 2017. The sustainable development oxymoron: quantifying and modelling the incompatibility of sustainable development goals. *International Journal of Sustainable Development & World Ecology* 24, 6 (2017), 457–470. <https://doi.org/10.1080/13504509.2016.1235624>
- [58] Jacob Thebault-Spieker, Loren Terveen, and Brent Hecht. 2017. Toward a Geographic Understanding of the Sharing Economy: Systemic Biases in UberX and TaskRabbit. *ACM Trans. Comput.-Hum. Interact.* 24, 3, Article 21 (April 2017), 40 pages. <https://doi.org/10.1145/3058499>
- [59] Anna Lowenhaupt Tsing. 2012. On NonscalabilityThe Living World Is Not Amenable to Precision-Nested Scales. *Common Knowledge* 18, 3 (2012), 505–524.
- [60] John Twigg and Irina Mosel. 2017. Emergent groups and spontaneous volunteers in urban disaster response. *Environment and Urbanization* 29, 2 (2017), 443–458. <https://doi.org/10.1177/0956247817721413>
- [61] Vasillis Vlachokyriakos, Clara Crivellaro, Pete Wright, and Patrick Olivier. 2018. Infrastructuring the solidarity economy: Unpacking strategies and tactics in designing social innovation. In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems*, 1–12.

Received July 2021; revised September 2021; accepted October 2021