"This is not a free supermarket": Reconsidering Queuing at Food-sharing Events

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"This is not a free supermarket": Reconsidering Queuing at Food-sharing Events

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ABSTRACT

This paper addresses the sociotechnical challenges of organising queuing at large scale, face-to-face, food-sharing events. The authors have partnered with a grassroots food-sharing community, FoodSharing Copenhagen (FS-CPH), to reconsider queuing practices at food-sharing events. The results present three "queuing canvases" that illustrate how FS-CPH members envision digitally mediated queuing at food-sharing events. The paper outlines three themes that emerge from this design work: communicating activism through queuing, encountering others through queuing, and transparency in queuing mechanisms. We discuss how the envisioned ideas illustrate novel perspectives on queuing in volunteer-driven settings, while sometimes falling back on accepted norms and common expectations of how queuing should work. To address this, we present a set of sensitivities, for designers and activists alike, to design for queuing in settings where non-monetary sharing is central.

CCS CONCEPTS

• **Human-centered computing → Collaborative and social computing design and evaluation methods**.

KEYWORDS

Food-sharing, Queuing, Volunteer-driven Initiatives, Participatory Action Research

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1 INTRODUCTION

This paper builds on previous work [2] to investigate design spaces for alternative queuing mechanisms at face-to-face food-sharing events run by Food-Sharing Copenhagen (FS-CPH), a volunteer-driven initiative focused on reducing food waste.

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Over the last decade, HCI and CSCW scholarship have investigated food practices as relevant sites for the design of digital technologies [9, 10, 46]. Research has, for instance, illustrated the role technology can play in enabling just [45] and sustainable [32] food systems, where sharing and redistributing surplus food are paramount. Research has also focused [8, 15, 20] on how digital technologies can structure sharing relationships between food donors and recipients.

Relatedly, work at the intersection of economics and environmental sustainability [40] has identified three emerging models of food-sharing, namely: *i)* sharing for money, mostly based on a for-profit model for food waste reduction; *ii)* sharing for charity, where food is given to people in need, oftentimes through the mediation of charitable organisations; and *iii)* sharing for community, where food is distributed among individuals who share an interest. Commercial platforms, such as Too Good to Go [24] and Karma [34], charitable organisations, such as FoodCloud [17] and FareShare [16], and platform-mediated initiatives, such as Olio [44] or Foodsharing.de [14] are respective examples of these models.

This article contributes to the area of Food and HCI by illustrating the ways digitally mediated queuing can be structured at face-to-face events to facilitate food distribution when both communicating community's activist concerns for food sustainability and enabling smooth food collection are central. Our previous work on FoodSharing Copenhagen [2] has detailed how, through the volunteers' work, surplus food is transformed from a commodity into a gift to be shared with attendees. Framing surplus food as a gift foregrounded a number of volunteer concerns with *queuing* practices at food-sharing events. As illustrated, the organisation of queuing was central to the volunteers' hands-on work to structure the flow of attendees at face-to-face events, but also to their efforts to uphold an activist agenda (i.e., making visible the limits of current food systems) and to distribute food fairly among attendees. This highlighted how the configuration of a seemingly mundane practice like queuing was in fact central to shaping the sharing dynamics of the community.

Building on this work [2], this paper explores different ways to configure queuing practices at face-to-face food-sharing events. The design explorations discussed focus on both the role existing technologies could play in mediating these practices, and on the relevance of values –e.g., fairness, care, education, knowledge exchange, or sense of community – in shaping the way in which queuing at events is organised and conceived. The design explorations resonate with critiques of contemporary sharing platforms for favouring efficiency, instead of valuing social interactions, care [5, 36, 47] and trust [37], and the political qualities of the initiatives they enable [41] – e.g., illustrating alternatives.

The empirical data were collected during a co-design workshop, held in February 2020, where five members of FS-CPH participated to explore the potential role of technology in enabling queuing mechanisms at food-sharing events. Data were also collected by means of participant observations which the first author carried out over the course of three consecutive weeks in February 2020.

The results introduce three design canvases that were produced by the workshop participants. They envision the role digital technologies could play in supporting queuing practices centred on values, such as building community or encountering others, instead of merely minimising waiting time. Three overarching themes stemming from the analysis of the canvases are discussed: *i)* communicating activism through queuing, *ii)* encountering others through queuing, and *iii)* concerns for the transparency of queuing mechanisms. In discussing the results, we address how, through their designs, workshop participants presented alternative ways to design queuing mechanisms while sometimes being drawn back to conventional practices. We conclude by presenting a set of four design sensitivities that are intended to help designers and activists to design and implement queuing mechanisms in the context of volunteer-driven initiatives.

2 RELATED WORK

The work presented builds on previous research on food sharing and queuing practices.

2.1 Food-sharing

With approximately 1.3 billion tonnes of food wasted around the world every year [27] it is not surprising that food waste reduction has been included as part of UN sustainable development goal 12: *Responsible Production and Consumption*, which aims to halve per capita global food waste at retail and consumer levels and reduce food loss along production chains by 2030 [52]. As a response, practices of (re)distributing or 'sharing' surplus food items, from individuals or businesses, have seen a surge in popularity [7, 8, 22]. Digital technologies have transformed the way we conceive of and (re)distribute surplus food across different contexts [12], and research has outlined sociotechnical configurations of food-sharing through three emerging models namely; For profit, for charity, and for community [40]. In what follows, we use these three models to review existing food-sharing technologies and previous research on the topic. These models help to outline some of the common patterns and differences between the various initiatives working with food surplus redistribution.

Sharing for profit. Native Apps, such as Karma [34] and Too Good To Go [24] are indicative of a growing marketplace for surplus food where digital platforms are used to connect consumers to restaurants and supermarkets selling surplus meals at discounted prices. The impact of these platforms can be seen as the normalisation of unsold food by making end-of-day food available to a wide audience of consumers.

Sharing for Charity. Food banks are perhaps the most well-known example of food-sharing worldwide, wherein donated food, much of which would otherwise be wasted, is made available to those in need [40]. The sharing for charity model has recently been streamlined by digital platforms such as Foodcloud and FareShare who use ICTs to manage and redistribute large supplies of surplus food from retailers to local charities as efficiently as possible [17]. Although such platforms address the technical challenges of food (re)distribution, one could argue that they fail to engage with the social issues that often surround the sharing for charity model. For instance, research has shown that the experience of accessing food banks, or other emergency food relief facilities, is often coupled with negative emotions such as guilt, shame, embarrassment, or a feeling of indebtedness [15, 23, 53]. Where others have raised the question of whether relying on surplus food is appropriate – e.g., for vulnerable people – highlighting how the practice may "undermine calls for direct actions to both reduce the production of surplus food and to address upstream drivers of food insecurity and ensure the right to food." [6, p. 1].

Sharing for Community. Initiatives within this model typically share food for free, without distinction between those who are accessing the services based on financial disadvantage or those who are simply making an ethical choice to prevent waste. For example, Foodsharing.de is a community platform in Germany that enables consumers, farmers, organisations, and retailers to offer and collect food articles for free in order to save them from being wasted [14]. Involving no monetary transactions, and attracting all sorts of participants, this platform fits the sharing for community model. However recent work by Ganglbauer et al. [22] has demonstrated how easy it can be for community-based sharing initiatives to fall back into the dominant models of sharing, such as those typical of charitable settings where distinctions were made between 'help-seekers' and 'help-givers'. As noted with respect to charitable initiatives, such distinctions can lead to feelings of shame and stigmatisation of those who access free food, creating friction in community settings where assumptions of the food system are transformed. Another example of the sharing for community model is the highly successful food-sharing mobile application, OLIO [44]. Although OLIO is a private, profit-driven company, food is still shared with consumers for free. The revenue required to employ staff to design, build, test, monitor, measure and maintain the app is generated by charging larger businesses for the service of organising volunteers to collect surplus [44]. The work of actually rescuing and (re)distributing the food is carried out by volunteers. There are two distinct volunteer groups within OLIO; The first, referred to as *"Food waste heroes"*, take a 'hands-on' approach acting as intermediaries between businesses and consumers. The second, referred to as *"Ambassadors"* are encouraged to help advertise and promote the application [29]. Practices of sharing food in both OLIO and Foodsharing.de require participants to create and/or respond to posts, negotiate meeting places and times, and to physically meet to exchange the food. Solikyl (meaning Solidarity Fridge) [50], an initiative in the Swedish city of Gothenburg, takes a more localised approach to (re)distributing surplus food. Surplus food from both individuals and grocery stores is stored in solidarity refrigerators in public spaces or other easily accessible locations across the city. The initiative is described as creating "a gift economy" around food that is suitable for consumption but which is still thrown in the bin [7].

This previous work has shown that technology is widely used by food-sharing communities for communicating, organising and network building [8, 13, 21, 22, 32]. There is, however, a lack of

research on the role digital technology can play in both facilitating and configuring social dynamics and mutual relationships between the different participants at sharing events – e.g. among attendees, but also between attendees and volunteers.

2.2 Queuing

Queuing practices have been characterised as examples of moment-to-moment interactions that are sustained by participants [25, 38, 51]. Studies have illustrated the situated circumstances that make, for instance, jumping queues a breach of social norms [35] or a desirable act needed to move on [43]. Although much of the past research on the topic of queuing in HCI engages with and designs for situations where there are 'customers' being 'served'– see for example [4, 26, 28, 42]– many of the design considerations could be applied to the design of queuing in community settings.

Norman [42] has argued that "painful" queuing experiences are the result of a past emphasis on cost and efficiency, while fairness, equity, and the experience of people as critical metrics for queuing have been largely ignored. Queues allocate goods based on the ability and willingness to wait, just as markets allocate goods based on the ability and willingness to pay [48]. With this in mind, not knowing how long the wait time will be can be stressful, suggesting that providing an estimation of how long one must wait could greatly improve the queuing experience. For example, in a recent CSCW article, Goncalves et al [26] report on the development and evaluation of a situated crowd-sourcing mechanism that could estimate queue length in real time in a food service setting. The system used interactive kiosks to collect human estimations about their queue waiting time. Nevertheless, the results showed that the majority of customers were either unwilling to provide data, or struggled to estimate approximate wait times. One of the major determinants of emotional unhappiness is fear of the unknown and uncertainty suggesting that a "clear, unambiguous conceptual model of how the line operates" is essential [42].

On the contrary, Brown [4] reflects on how with little or no verbal interaction between those standing in a queue, coordination is done through bodily interactions, and that this inherent knowledge of queuing is formed through experiences from childhood. However, when confronted with unfamiliar service environments, in another country for example, we must actively assess the new situation.

We can see examples of queuing situations where focus on waiting has been removed, arguably making space for people to engage in other activities. Work by Hardemo [28] explores how to provide greater action space for participants in a queue and enable for new forms of queuing, without deviating too much from features of queuing that are necessary to maintain. Moreover, our past work with FS-CPH [2] revealed how volunteers reconfigured queuing at food-sharing events from a traditional line aggregation to a ticketed system. This way attendees could find a place to sit down, or socialise with friends without worrying about losing their place in line. Sequentiality and the idea of first come, first served is often equated with fairness in queuing systems. Brown [4] describes how queues also act as moral structures enforced by sanctions and stigma and those who break the structure, by 'jumping the queue for example', can be held accountable by others. Understanding how certain norms of queuing become deeply embedded in social contexts allow us to navigate the scope for designing new and experimental queuing mechanisms.

3 SETTING AND MATERIALS

FoodSharing Copenhagen (FS-CPH) was founded in 2016 as a grassroots initiative to tackle local problems of food waste. What began as peer-to-peer sharing, where people exchanged food items that would otherwise go to waste in their homes, quickly developed into a larger scale operation. Today almost twenty local businesses – major supermarkets, wholesalers, and bakeries – donate unsold food to the community. To redistribute collected food, FS-CPH holds three weekly food-sharing events on Mondays, Wednesdays, and Saturdays, in three different neighbourhoods of the city. The food is shared for free and events are open to everyone, regardless of economic need. Approximately one hundred volunteers do the groundwork, from organising events to collecting, sorting, and redistributing food. Three distinct participant groups collaborate within the community through different food-sharing roles. The volunteers who organise and run food-sharing events; the local businesses that donate surplus food for sharing events, and the attendees, that is to say people who participate in food-sharing events to collect food.

The three weekly food-sharing events vary in size. The longest running event, established in 2016, is held each Saturday afternoon and attracts an average of 220 attendees each week. In 2017, as the community expanded, a second event was established on Wednesday afternoons which attracts an average of 160 attendees. The third and most recently established event began in late 2018. This event is held on Monday evenings and is considerably smaller in scale, attracting an average of 80 attendees each week. Our previous work has illustrated how FS-CPH is organised as a community [1], and unpacked the practices whereby food is collected from donors, selected (i.e., sorting out inedible from edible food items) and transformed into gifts to be collected by attendees [2]. While discussing the activist agenda of the community, this work has also highlighted [2] the importance to manage the flow of attendees at food-sharing events, and the volunteers' efforts to implement queuing mechanisms as part of organising events.

3.0.1 Queuing at food-sharing events. As our previous work shows, managing the sequence and flow of attendees at food-sharing events can be directly related to the values of the community [2]. In 2018, the community decided to replace the traditional queuing method where attendees stand in line, with a new, unique queuing system that is not based on expectations of sequentiality. In the new system, attendees are assigned to smaller groups using picture tickets handed out at the beginning of each event. There are twenty-four different groups each represented by a picture of a fruit or vegetable, and these groups are called in a different order at each event. There are 240 tickets in total, ten of each fruit or vegetable. While tickets are being randomly distributed, attendees listen to an introduction speech given by a volunteer. After that, a poster showing the order in which the groups will be admitted is presented beside the entrance of the venue. On the poster, each picture is now associated with a number and the order in which the groups are called changes at every event. A volunteer stands by the door to call out the group

names, welcoming the attendees in each group and recollecting the tickets.

In a previous publication [2], we have identified the issues faced by both volunteers and attendees while interacting with the picture-based queuing system. Most notably, attendees reported a general confusion with the system and difficulties in hearing their group being called; volunteers criticised the design for allowing attendees to cheat by collecting more than one card to increase their chances of early admission to future events. These points of friction with the current organisation of queuing prompted the design workshop conducted for this study.

3.1 Research Approach and Data Collection

The empirical material stems from the first author's engagement with FS-CPH. As reported in [1, 2], an ethnographic approach has been previously adopted, between 2018-2019, to gain a nuanced understanding of the community and its members, how food distribution is organised and the role of digital technology within the community. In the beginning of 2020, a second phase of data collection was organised by the first author who engaged with the community for a period of about three weeks while shifting towards the adoption of a Participatory Action Research (PAR) approach [31].

Ethnography was suitable to make visible the details of organising food-sharing events and following the analysis, queuing practices stood out as a critical design issue/point of contention within the community. Nevertheless, the first author's concerns to produce research and design outcomes that would be useful to the community were reasons to transition to a PAR approach. As an action researcher she has engaged with all the stakeholders of the community and encouraged them to directly participate in the project as co-investigators [18]. This has helped combine contextual inquiries of the community with design work exploring ideas about digitally mediated queuing practices at sharing events. Participant observations were conducted by the first author over a period of three consecutive weeks. Following this, the first and second authors facilitated a cooperative design workshop with five members of FS-CPH. With regards to the three phases of the Action Research helix model [30] – *plan, act, reflect* – this study outlines the *plans* for digitally mediated queuing mechanisms. Unfortunately, in compliance with Covid-19 restrictions, all food-sharing events have been suspended, thus preventing any real world intervention of the designs, and a move towards the subsequent steps of the helix model.

3.1.1 The workshop. The design workshop lasted three hours and was conducted in the community centre where the Monday events take place. An open invitation to attend the workshop was extended through public announcements at food-sharing events, and through a Facebook Event shared on FS-CPH's Public Facebook Page. *Five* people volunteered to participate in the workshop: *three* highly active volunteers, *one* former attendee/new volunteer, and *one* newcomer who had recently discovered the community online. The goals of the workshop were threefold. First, to explore different experiences of queuing and the activities, values, and other socio-cultural aspects associated with it. Second, to dig deeper into the experiences and values associated with queuing from the perspective of both event volunteers and event participants to understand the pains and gains of established queuing systems. Third, to understand how community members envision the role of technology in queuing mechanisms.

The workshop was based on two main activities. The first focused on discussing personal experiences of queuing in different contexts. To make the discussion concrete, participants were asked to bring their own pictures of a queuing event they found interesting or use one of the pictures provided by the workshop facilitators. Each participant was asked to comment on the picture. Following this, participants were invited to share their queuing stories, involving both positive and negative queuing situations they had experienced. As a group, we unpacked each experience and tried to pin-point what factors contributed to the enjoy-ability or frustration that arose from each situation. This task lasted for approximately *one hour*, and to document it we created a poster that mapped values of queuing that could be considered as either "pains" or "gains". The entire discussion was also audio recorded with the participants' consent.

The second activity encouraged participants to envision what food-sharing events would be like using queuing mechanisms centred on specific values and technologies (see *fig.* 1). Participants were provided with a queuing canvas template (inspired by the Business Model Canvas [33, 49]), a set of value cards and a set of tool cards. On the canvas we posed the question: *"What if queuing prioritised [value] and [value], using [tool] and [tool]?"*. The document had space to attach two value cards, two tool cards and a large blank space underneath to describe how queuing could work. However we invited participants to choose more cards if they wished to do so. We had prepared 15 value cards, encompassing values such as, *community, cooperation, environmental sustainability, care, and fairness*. In addition to these pre-made cards, the values that emerged during this first activity were carried forward through making additional cards, for example *tradition, responsibility, and efficiency*. Similarly, we had previously prepared fifteen tool cards for the task to represent a combination of digital and non-digital artefacts. Some examples of the digital tool cards were: *QR codes, block-chain technology,* and *smartphones*; some examples of the physical tool cards were: *a deck of playing cards, a mechanical click counter*, and *raffle tickets*. Again, we also provided some blank cards so participants could add any possible additional tools they wanted to include in their designs. The task lasted for one hour and fifteen minutes. Following this, each team had fifteen minutes to present their designs and discuss them with the rest of the group. The entire activity was audio recorded with the participants' consent.

3.1.2 Participant Observations. Approximately *forty* hours of participant observations were conducted, covering nine food-sharing events of about four-five hours each. Participation aimed at gaining insights and first-hand experience of the community's core values and queuing practices at events. This was achieved by signing up to volunteer for different tasks and thus interacting with food donors, attendees, and fellow volunteers in food collection, selection and distribution at sharing events. These moments were essential to understand the volunteers' challenges of running events, particularly managing the flow of attendees. Moreover, the author spent

time outside the events waiting with and speaking to attendees to experience queuing at food at sharing events. The data collected was documented through photographs and video material that show volunteers handing out queuing tickets and giving a welcome speech at the beginning of the food-sharing event, attendees queuing for food, and volunteers explaining how they sort food out. The first author also kept a field diary which was annotated after each instance of participation. The diary described what had happened at events, how the author had experienced taking part in them, and her reflections about the attendees and volunteers' experience of queuing.

3.2 Data Analysis

The analysis includes materials produced during the workshop (i.e., the pains and gains document and the three design canvases), the transcriptions of the conversations between all the workshop participants, and the diary entries, video clips, and photographs that were collected through participant observations. The analysis was conduced collectively and iteratively by all three authors by means of thematic analysis [3]. The authors began by focusing on the documents created during each workshop task. This data was triangulated with the analysis of the audio recordings. During a first round of analysis, we focused on themes concerned with transparency, trust, fairness, expectations, and delegation of queuing to another person or to an artefact. Following this, the authors conducted a second phase of data analysis where the supporting data from the diary entries, video clips and photographs were examined. This allowed us to relate the themes of the workshop to the first author's direct experience of participating in FS-CPH. During this phase, the challenges of communicating activism, establishing relationships with others, and the tensions between concerns for efficiency and socialising emerged as key issues to consider in re-designing queuing at food-sharing events.

4 RESULTS

The results below synthesise the design reflections developed by the participants in the workshop and triangulated with observational data collected during food-sharing events. The reflections illustrate how digitally mediated queuing practices can be reconsidered to facilitate food-sharing at face-to-face events, while supporting core values of the community. The term queuing mechanism is used to refer to the sociotechnical issues of the presented ideas, thus including both technological and socio-cultural aspects of technology use. The name of each canvas has been assigned by the authors. For each queuing mechanism, we highlight the tools or aspects that can afford or constraint specific framing of queuing and queuing-related behaviours.

4.1 Canvas 1: Saving time through digitally-mediated queuing

The queuing mechanism summarised in Canvas 1 (*fig.* 1, left) explored practices of digitally mediated queuing. By focusing on the question *"What if queuing prioritised values, such as safety and speed, by using location tracking and a digital information kiosk?"*, this canvas highlights the practical problems that technology could solve, such as overcrowding and long waiting times. The group explained that they had chosen the cards for their canvas randomly, to explore what ideas they could come up with. One of the chosen values cards– *safety* was created by the participants, while the second value card– **speed**, and both the technology cards– *location tracking* and *digital information kiosk* had been provided by the authors. Participant 1 in this group was the person at the workshop with the least experience of the community, as he had only recently discovered the existence of the food-sharing events through Facebook. Participant 3, on the other hand, was a very active member of the community, and he regularly held the role of lead volunteer ("shift leader", as the role is normally referred to) at the Wednesday and Monday events. As Figure 1 shows, the group wrote on the document of the canvas that the mechanism would allow attendees to register their information before events begin to then arrive at different times.

While presenting their idea, the group explained that queuing would be delegated to a mobile application, where GPS tracking technology would be used to determine the distance of each attendee to the event location. This data would then determine the queue order to enter and leave events. It was suggested that the mechanism could allow attendees to register, individually or in small groups of family or friends, and to come directly or within a two-hour time slot. In this socio-technical arrangement, volunteers would have pre-divided the surplus food into bags, thus allowing each attendee to collect approximately the same amount, quickly and efficiently.

A number of pros and cons were also listed. The former included qualities such as "quick" food pickup, the possibility to notify volunteers of 'pushy people', or possible violent incidents. The latter encompassed the possible unwillingness of some attendees to use the app enabling this service, the possibility to give incorrect information and for people to arrive at the same time, and the possible issues that could arise if the algorithm failed/crashed. As participant three described, this vision of queuing was centred on the idea to allow only a small number of attendees into the event at any given time:

> "Attendees will escape from waiting since they don't need to be there to wait in line, and see that they can pick a time that works for them. They're coming over, we give them the food and then they go. Bye bye, haha." (Workshop Participant 3)

Discussing their design idea with the rest of the group, the participants behind this efficiency-centric queuing mechanism acknowledged some trade-offs of organising food distribution this way, for instance, attendees not having the opportunity to choose their own food, or being uncomfortable with sharing their pre-event location.

Issues of digital exclusion were also addressed in relation to limiting access to those who have smartphones. However, they believed that elements of the design could be worth considering in relation to safety concerns at events. For example, participant three described an experience where, due to the large crowd, attendees were pushing each other to reach the front and he grew concerned for those who may be pregnant or elderly.

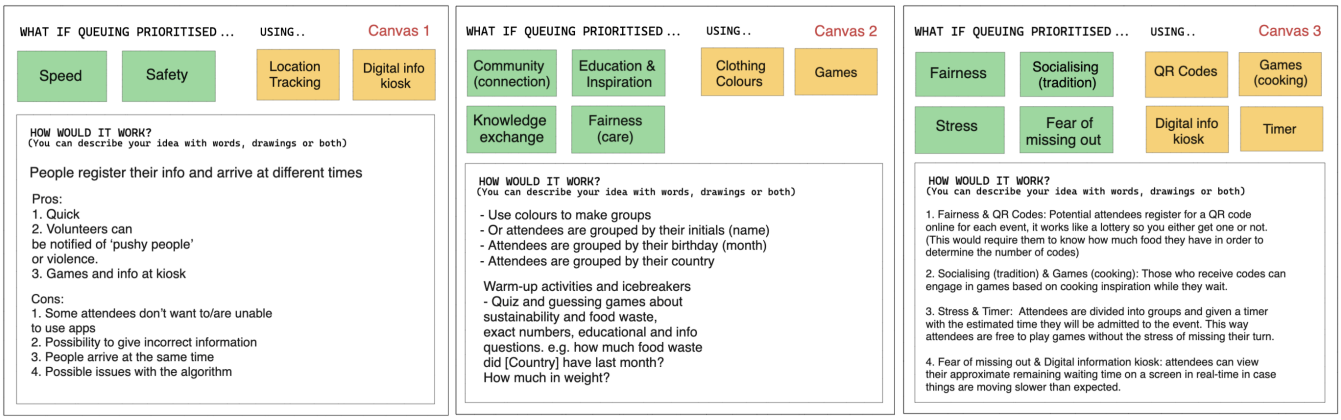

Figure 1: Digital replications of the three queuing canvases created at the workshop

4.2 Canvas 2: Face-to face encounters through queuing

The Canvas 2 (*fig.* 1, middle) proposed by participants 4 and 5 illustrates an almost opposite approach to queuing. The suggested ideas exclude digital tools altogether in favour of envisioning queuing mechanisms concerned with activism and face-to-face interactions. This canvas asked *"What if queuing prioritised values such as community education/inspiration, knowledge exchange, and fairness, using clothing colours and games?"*. Ignoring the suggestion to only pick two cards, the two participants chose four value cards, three of which – i.e., *community, fairness, and knowledge exchange* – had been provided by the authors, but were further specified by them. For example, under fairness they annotated the word *care*, and under community they added the word *connection*. The participants also created an additional card conveying the values of *education and inspiration*. The tool cards suggested for the design were *games* and *clothing colours*, the latter referring to the colours of the clothing worn by attendees. Both participants were highly active, long-term volunteers and had been working as shift leaders of the Monday events.

This canvas envisioned two ways the queuing mechanisms would work. On the one hand, the participants suggested that attendees could be grouped by the initials of their names, the month of their birthday, or their country of origin. On the other hand, they suggested warm-up activities and icebreakers as ways to trigger interactions between people. Concrete ideas included: quiz and guessing games about sustainability and food waste to share numbers and educational material about the issues. Questions, such as "How much food waste did Denmark have last month?" and "How much in weight?" were proposed.

While presenting the canvas, the group discussed two key queuing mechanisms. The first was focused on ways to facilitate sharing food fairly, by exploring possibilities to group attendees in alternative ways. It was suggested that their clothing colour, the initials of their names, their month of birth, or nationality could be called at "random" by volunteers to determine the order in which attendees would enter events. The mechanism was described as being quite similar to those of the queuing picture ticket system currently used at events (as described in 3.1.2), but more fair as attendees would have less opportunities to cheat by not returning their queuing tickets, a problem volunteers have currently to deal with. For the second queuing mechanism, the participants suggested that the volunteers could facilitate *warm-up activities* or *icebreakers* that could encourage attendees to interact with one another. Activities could take the form of educational quizzes and guessing games about food waste and food system sustainability. These activities were described as multipurpose mechanisms that could entertain attendees while waiting to enter the event. The were seen as a way to encourage attendees to connect and understand each other, and as necessary reminder of the reasons for food-sharing events to take place – i.e., to reduce food waste. While presenting the idea, participant 5 stated:

> "We don't see the waiting time as wasted time, we want to see it as an opportunity to educate [attendees] around food waste, because we don't want people to have this perception that they are just coming to get free food, we want to use the space for, like, education around food waste but also to create this feeling of community" (Workshop Participant 5)

4.3 Canvas 3: Balancing efficiency and socialising while queuing

The queuing mechanisms proposed in Canvas 3 (*fig.* 1, right) sought to address both issues of efficient food collection and social connection. This canvas explored the question *"What if queuing prioritised values, such as fairness, stress, socialising, and fear of missing out, by using QR codes, games, a digital info kiosk, and a timer?"*. The value cards *stress* and *fear of missing out* and the tool card *games/cooking inspiration* were created by the participant herself. This participant drew on her early experience as an attendee and her current involvement as a volunteer to develop this canvas.

The canvas addresses some of the barriers to socialising at food-sharing events; each value was directly connected with a corresponding digital tool. For instance, issues of fairness were connected to the use of QR Codes. Potential attendees would register online to enter into a lottery for a QR code based ticket that would

grant entrance to the event. Potential attendees might get or not get one, but this would require FS-CPH volunteers to know in advance the quantity of collected food to determine the number of codes to make available. Socialising was instead linked to the possibility of performing (cooking) games. Here, receiving a QR code was considered as a prerequisite to participate in cooking inspiration games while waiting. To alleviate the attendees' stress, for instance, fear of missing out their turn, this canvas suggested that attendees could be divided into groups, and given a timer with the estimated time they will be admitted to the event. The fear of missing out was also connected to the use of a digital information kiosk, where attendees could see in real-time, on a screen, their remaining, approximate waiting time.

While presenting this vision, the participant explained that the group size and the uncertainty of waiting times can be barriers to socialising at food-sharing events and to developing a sense of community. Moreover, even if one does choose to engage with others, the uncertainty about waiting time can result in attendees avoiding distractions in fear that they will miss their opportunity to collect food.

To tackle this, this design canvas proposes the development of an algorithm that could facilitate a lottery to attend events. Attendance would be capped at a certain number, so potential attendees could enter to win a digital ticket in the form of a unique QR code each week, and the algorithm would assign attendees into smaller groups that wait together in a smaller queue. The underlying idea is that a smaller number of participants could reduce stress among both volunteers and attendees as it would be easier to organise and share the food. This could allow more time for participants to socialise and develop/maintain the core values of food-sharing, and to facilitate such interactions, she proposed to have a digital information kiosk where attendees could create a shared recipe bank and play cooking themed games. To address the potential stress of missing one's turn, the mechanism would include an information kiosk showing the approximate waiting time. Participant three describes the working of this queuing mechanism as follows:

> "There would be several groups of people, and every group would be set to take pretty much 20 minutes to get inside, take the food and get out. So, [those outside] know that for 20 minutes they're completely stress free, and they can just play and socialise and have fun. And still there will be digital information just so you can also see which group is in now and if they're coming out or if they want to take a bit more and I'm going to have it less, you can kind of keep track of it." (Workshop Participant 2)

In the QR code lottery mechanism described above the potential of harnessing digital tools to share food fairly is explored. Participant 3 explained that *"sometimes [the attendee] would get the chance to get free food and sometimes they wouldn't."* This point led to a group discussion on whether randomness could be considered as fair, and as a group we went on to explore how one might construct a fairness mechanism behind a randomised system. It was decided that transparency would be important so users would understand how the decision was made. And perhaps it would also be necessary to include a weight function to give some elements more "weight" or influence on the result than other elements in the same set. This could help to prevent the same set lucky attendees getting food each week, by giving unlucky attendees or newcomers higher weights and therefore a greater chance.

5 EMERGING ISSUES

The following sections introduce three overarching themes that stem from the canvas designs, and that are corroborated by the analysis of participant observation data. The first theme highlights concerns to communicate food waste activism through the design of queuing mechanisms at food-sharing events; the second theme draws attention to the role of queuing as a way to build community and not only facilitate effective transactions; the third theme addresses the tensions that arise when different values are considered in the design of queuing mechanisms.

5.1 Communicating Activism through Queuing

Communicating that food-sharing events are opportunities to engage with issues of food waste reduction, rather than to just receive free food, was a recurrent theme during the workshop. The queuing mechanisms presented in Canvas 2 specifically address this point. While presenting them, the two participants suggested that queuing at events should not be considered as wasting time, but as an opportunity for people to learn about the local scale of food waste, its impact on the environment, or about individual strategies to help reduce food waste, for instance, at home. This canvas suggests that quizzes and guessing games could be organised by volunteers and implemented as part of queuing at events.

Canvas 2 explicitly focuses on designing mechanisms that could incorporate awareness about food waste reduction towards environmental sustainability. Hence the concern to communicate activism. The participants who envisioned this canvas did not consider necessary to use any digital technology to help people learn about food waste. Instead, they regarded the possibility to enable social interactions among attendees as central to this goal. Although they did not explain how questions about food waste would be made available at sharing events, it can be assumed that providing them on paper, for either individual or collective use, would be enough.

Furthermore, as these participants emphasised, valuing activism contrasts the idea that long waiting times should be avoided – see, for instance, Canvas 1. As the quote below illustrates, food waste reduction, and not quick food delivery, is the main purpose of food-sharing events. This means that digital technology should not just reduce queuing time, and that attendees should understand that FS-CPH is not a free supermarket:

> "It's not a supermarket you know like if you want to have things quickly you can go and pay like this is not I feel, the purpose of food sharing, is not to, you know, have food for free really quickly. The point is, you know, raising awareness and trying to work against the current food system. So by doing this you take that focus and initial value away from it, by making it a free service that people, you know, just have on their smartphone." (Workshop Participant 4)

The observational data also points to the links between the experience of queuing at events and the concern of the community

to make food waste visible to broad audiences. For instance, a welcome introduction speech is held by one of the volunteers at the beginning of each sharing event. The speech serves the purpose of introducing FS-CPH, its values, and its main objective to prevent and reduce food waste through collective action. Through this speech, the volunteer in charge also distributes the queuing tickets to the attendees, while explaining how the event and queuing are organised. The following quote is an excerpt from the speech given by a volunteer at one of the Wednesday events; it explains where the food comes from and where it would end up, were it not for the work of the organisation:

> "Foodsharing is an organisation that collects [surplus] food from different shops and markets to give it out to you rather than have it rot at the dump because that's where it would have ended up. The food is generally fine and we sort out and throw away any items that are bad." (Event Volunteer 1)

Furthering this point, volunteers are also concerned about attendees being conscious of how much food they take, and how much of it they will realistically consume within a short time. If attendees take food items that they will not eat, just because they are free, the food can end up just going to waste in their homes rather than in the supermarket.

To sum up, developing mechanisms, such as quizzes or social games, to spread awareness and build knowledge on food waste reduction, can transform queuing practices and the purposes they serve. Queuing can be a means to communicate and understand the goals of the community and engage with sustainability more generally, instead of merely getting attendees through events as quickly as possible.

5.2 Encountering Others through Queuing

The three canvases developed propose queuing mechanisms designed to encourage interactions among attendees. While none of the workshop participants meant that attendees would be forced to engage with unknown persons, relating to others was regarded as a way to develop a collective experience of food-sharing events. Canvas 2, for instance, draws attention to the possibility to use quiz or guessing games as ways to trigger interactions among people while engaging with issues of food waste activism. Likewise, in Canvas 3, the group explored ways to facilitate social interactions among attendees by using tools, such as a digital information kiosk or a timer. While the use of these digital devices was not discussed in detail, it was suggested that their main role would be to provide attendees with awareness about the remaining waiting time. This would, in turn, allow them to engage in social activities, such as creating a shared recipe bank or playing food themed games. Even Canvas 1, which mostly focused on fast and efficient queuing, included a digital information kiosk with interactive games that attendees could use to engage with one another at events.

In different ways, these different visions of queuing suggest that food waste reduction is something we do together, and that the impact of the community is achieved through individual actions that scale at a collective level.

The following sections introduce "sharing fairly" and "making queuing an enjoyable experience" as two challenges the workshop participants outlined while discussing how digitally mediated queuing mechanism can become opportunities to encounter others.

5.2.1 Sharing fairly. Volunteers at food-sharing events can be regarded as "fairness-stewards". Part of their job during events is to guide attendees through the processes of collecting food, make sure that everyone collects some food, and that more coveted food items are still available for those who need to wait for a longer time. The suggestions in Canvas 2 to group volunteers based on the colour of their clothes or the initials of their names, and then randomise the order of entrance to events, reflect this concern.

Through the participant observations, we know, for instance, that the picture-based queuing system is designed with these concerns in mind. Here pictures of food items are distributed to attendees who are then called in groups for food collection (attendees who have a picture with the same food item belong to the same group) regardless of the time of arrival at food-sharing events.

Moreover, once attendees enter events, expert volunteers estimate how much food each attendee can take, based on the amount of available food donated that week. Volunteers also use a mechanical click counter to keep track of the number of attendees. As they explained, this is done to keep a record of the number of weekly attendees to improve planning and organisation of events. For example, if they know the average number of attendees each week, they will have an idea of how much food they will need to run a successful event where each attendee can get a substantial, fair, amount.

Fairness in food distribution is central to the ways volunteers structure the flow of attendees at events. During participant observations, we have learnt, for instance, that a Monday event was cancelled to avoid disappointment once the volunteers realised that the donated food would not be enough for the average turnout of 80-100 attendees that typically attend the Monday event. In late March 2020, a new model of sharing was implemented on a trial basis, where volunteers would ask attendees if they would like some of a certain item and then hand their "fair share" to them (based on estimations that occur before events). The first author was present when the volunteers discussed the outcome at the de-briefing of one of the Saturday events during which one volunteer commented that:

> "This way of distributing the food made for a smoother exchange than having attendees take items themselves. I felt it made expectations on how much to take more clear, and that seemed to make the attendees more comfortable and I think there were less conflicts than usual." (Event Volunteer 2)

5.2.2 Queuing as an enjoyable experience. Both Canvas 2 and 3 envisioned queuing mechanisms that would encourage people to build relationships with each other. Discussing possibilities to share interests and recipes, or to learn about food-system sustainability were considered as options to make queuing an enjoyable experience.

During the first task of the workshop, participants were asked to share experiences of queuing in various contexts. The discussion highlighted how a sense of camaraderie and a feeling of being together can stem from queuing situations. Participants, for instance,

spoke about the experiences of attending concerts where the act of queuing was enjoyable:

> "You end up like talking to other people in the queue. And it's like an event in itself, you feel like you're in it together with the other people." (Workshop Participant 4)

Here, the experience of arriving early at a concert for a spot at the front of the venue connects to the possibility to share a passion and to socialise in the queue while waiting. This transforms the meaning of queuing: from purely instrumental practices needed for something else to valuable, enjoyable moments of a concert experience as a whole. This point is further addressed in the quote below, where one of the workshop participants talks about her experience of queuing for bread, with friends and family, after fasting during Ramadan. She explains how she looks forward to the tradition of queuing, more so than the actual bread itself:

> "I hate that bread. I don't eat the bread at all. But then the queue is just so fun." (Workshop Participant 5)

5.3 Transparency in Queuing Mechanisms

The queuing mechanism proposed in Canvas 1 was efficiency-centred and focused on the benefits of creating a streamlined service, where attendees can enter and exit events quickly. Contrasting this vision, Canvas 2 envisions a less efficient, but socially richer food collection encompassing both community and activist values. Whereas Canvas 1 explores digitally mediated queuing as a means to solve practical problems (i.e., long waiting times and large crowds), Canvas 2 indicates the role queuing mechanisms could play in communicating the activist stance of the community. This latter issue was more a vision to strive for than a problem to be solved, and digital tools were not regarded as central to it. Looking at the two canvas together shows that visions about queuing can be polarised between a focus on practical aspects of food-sharing events –e.g., safety and speed – and one on the social aspects of sharing – e.g., relationships to others or knowledge exchange. The queuing mechanism proposed in Canvas 3 tackles both practical and community aspects of participating in food-sharing events. As the quote below indicates, concerns for attendees' smooth participation – specifically addressing the "fear of missing out" one's turn for food collection – are interwoven with socialising possibilities at events.

> "I remember that I was very afraid of missing something because it was not clear at all. But this was like one year and a half ago so probably it [has] become better since. But I remember I went to do it on Saturday and first we were queuing outside, then we were inside, then they told us to go outside again. I guess then they started giving us those numbers. Well, the pictures of food. And it wasn't even so clear why they were giving it, and suddenly you saw people giving it and then I was like, OK. They're giving it OK. I should find this person, whoever it is. And then you also wait to see, like, if you've got melon. What does it mean to be in melon is that group one or group five? And then you also keep waiting because they're like shouting Melon Group. And you might also miss it if you're not being careful. So you're constantly there and being careful." (Workshop Participant 2)

This point is corroborated by the observational data showing some of the attendees' frustrations about the uncertainty of how queuing at events works and the lack of information on how long it takes. One attendee explained, for instance, that after participating in many events, she knows it is worth to wait up to forty minutes to enter the event; however the first time she attended an event she was frustrated as she had not expected such a long waiting time.

Volunteers had strategies to manage the expectations of attendees at events. For example, at one of the Saturday events, volunteers realised that, on that occasion, they did not have as much food as usual. For this reason they warned the attendees who had tickets in the last 2-3 groups on the list that it may not be worth waiting as there might not be much food left. As it was observed at the time, several people in the last groups gave back their tickets instead of waiting. This instance is an example of the unpredictability involved when dealing with surplus food. Volunteers have no control over the amount of food that is donated for each event, and they must adapt, while also being transparent to let attendees know what to expect, even if it might lead to disappointment.

Data collected through participant observation reveals that the artefacts facilitating queuing (i.e., the posters and the tickets) and the associated practices (i.e. shouting out the name of a fruit or vegetable group) are not designed to enable transparency about the ways queuing is organised. While volunteering as the queue manager, the first author observed that attendees repeatedly asked whether their turn had been called or not. Moreover, those who had tickets that placed them in the first 8-10 groups would almost solely focus their attention on listening to their group to be called, while those in later groups stood further back chatting and socialising with friends or family members.

Concerns for transparency were discussed throughout the workshop as a highly valued factor for a queuing system that could help make queuing at events a more social and enjoyable experience. Participants included features in their queuing mechanisms that could create more transparency for attendees in terms of waiting times. The digital information Kiosk in Canvas 3 addresses this problem by envisioning a digital system that would provide real-time information about the queue progression. While the canvas does not specify where the display would be placed at events, or how many of them would be needed to make that information inclusively accessible, the envisioned artefact would differ from the posters currently used in that information is continuously updated. Relatedly, the attendance time slot, automatically generated by the location tracking application in Canvas 1, seeks to address attendees' concerns to minimise waiting time. While a straightforward implementation of this idea would reduce food collection to the experience of a free supermarket, this design surfaces concerns for providing information about waiting time.

6 DISCUSSION

The design material has outlined the challenges of reconsidering queuing at food-sharing events with regard to three distinct, yet equally significant, concerns: communicating activism, encountering others, and envisioning efficient and transparent queuing

systems. The discussion centres around the ways in which the participants' design considerations present alternative ways to design queuing mechanisms as well as highlight the problems that arose while designing in this space. We conclude with a set of four design sensitivities intended to help designers and activists alike to design and implement queuing mechanisms in the context of volunteer-driven, food-sharing initiatives.

6.1 Moving forward, falling back

The FS-CPH members who participated in the workshop explored ways to reconfigure queuing mechanisms based on values such as fairness, education, sociality, or knowledge exchange on food waste. Expanding previous work [2], these explorations outline concrete instances of the ways queuing could support mutual relationships, rather than merely focusing on the individuals standing in line.

As emphasised at the workshop, food-sharing events are not a 'free supermarket' where people go to collect food conveniently and efficiently. FS-CPH approach to food (re)distribution is more closely connected to principles of a gifting economy [1, 2]. Food items are gifted to everyone who wish to take them, and events are spaces where people, volunteers and attendees alike, can collectively care for the surplus food that would otherwise go to waste. For this reasons, aspects such as minimising waiting time are central, but cannot be regarded as the sole values scoping the design of queuing mechanisms at sharing events. Communicating activism, and being flexible enough to handle fluctuations in food supply and number of attendees are paramount to ensure a fair distribution of food items.

Providing alternatives to the traditional first come, first served model, fairness was considered as a way to make sure that all attendees get the same amount of food, regardless of their position in the queue. In this sense, "fair" is synonym to "equal". Fairness was designed for by randomising the order attendees would enter events, for instance, using a computational algorithm based on the colour of a persons clothing. Relatedly, the field data shows the volunteers' work to balance the amount of food available with the approximate number of attendees to ensure that everyone gets something, or their routines to keep some of the best food items for those who need to wait the longest.

At the same time, two of the three design proposals suggested queuing mechanisms that would give attendees a time slot to arrive at events, collect their food and then leave. This idea of queuing was regarded as an "escape" from long and uncertain waiting times. Moreover, issues related to efficiency were discussed in relation to the role of digital technology, while the social and activist activities were associated with face-to-face interactions.

While some visions of queuing at sharing events moved away from everyday experiences of queuing – for instance, at supermarkets – some others seem to fall back on them. We see challenges here to move beyond narratives that associate digital technology with ideals of efficient transactions, and with tropes of forced social interaction through gamification. While additional design activities could certainly help overcome this problem, volunteer-driven initiatives are challenging sites for design. Here, the lack of dedicated budgets and resources can result in the adoption of digital technologies originally meant for different settings [11]. Moreover, design efforts in volunteer-driven initiatives are typically instances of diffuse design (design performed by everybody) rather than expert design (performed by those who have been trained as designers) [39]. As volunteers come and go, or participate in different roles and forms, it is central to have shared understandings of what sociotechnical practices, values, and technological features are (more) desirable by the community as a whole. This could help avoid the design of sociotechnical practices that easily become counterexamples of core values community-led initiatives strive for. For instance, grouping people by the colour of their clothes, their year of birth or country of origin could challenge the bias that the first one showing up collects more–or better– food. Sharing potentially sensitive information would, however, create problematic privacy issues, especially in settings such charitable food organisations. Similarly, handing out pre-prepared bags of food can take away the attendees' choice of what food to take, which could result in waste, if attendees receive items that they may not eat. Finally, games could be seen as forced interactions rather than enjoyable moments.

6.2 Designing queuing in community settings

Below, we present a set of sensitivities to frame and scope the design of queuing mechanisms in volunteer-driven community settings. Trying to bring research outcomes back to communities [19, 31], we see these sensitivities as practical suggestions that activists can adopt to organise queuing and, therefore, the access to shared items. The sensitivities are meant to orient community members towards specific aspects that, we argue, should be considered in designing queuing mechanisms. We expect the emerging arrangements to vary depending on the specific contexts within which different initiatives operate. The formulation of the sensitivities draw attention to the *who, where, when,* and *why* of queuing in the context of volunteer-driven initiatives, particularly in relation to issues of sharing fairly, encountering others, and engagement with activist agendas.

Consider who is queuing. The first sensitivity considers how often people attend food sharing events in diverse constellations of families, friends, and acquaintances. This raises issues of whether queuing practices should be designed to facilitate the flow of groups of people, or single individuals, how their particular needs should be accounted for, and what fair sharing would be among them. People who are already in the company of others might perceive a more positive value in waiting, since being together at a sharing event is already a social occasion. This might make it easier to engage in activities beyond food collection – i.e. learning about sustainable food systems – since these interactions would take place with existing friends or acquaintances.

Consider where queuing takes place. The second sensitivity concerns the characteristics of the places where queuing occurs. Hanging out, socialising, and having the opportunity to engage with other attendees is more easily achieved in large, non-transitory places such as community centres. Digital technology can play a role in managing the flow of attendees in various ways. For example, digital platforms can enable one-to-one matching mechanisms as a precondition for physical encounters or enable queuing before arriving at events. Reflecting on the interconnections between digital technologies and the specific qualities of physical places can

reveal tensions between sociotechnical configurations that focus on waiting/queuing time and aspects such as community building and encountering others.

Consider when queuing starts. The third sensitivity considers consolidated experiences of queuing, such as reducing waiting time, which are also important in food-sharing communities. Digital technologies can allow to start queuing before being physically present at sharing events, which could lead to shorter waiting time for food collection, or ease the volunteers' job to handle crowds. This connects to reflections of whether other values can still be upheld. While queuing mechanisms centred on efficiency could help volunteers with what they see as fair food distribution, aspects of socialising would probably be overridden by a too narrow focus on when queuing begins.

Consider why people queue. Within the setting studied, volunteers are generally more concerned than attendees with upholding an activist agenda. Indeed some attendees may (rightly) show up at events to simply collect free food as quickly as possible. This difference reflects on the meanings different people attribute to queuing: from opportunities to encounter others and learn about food sustainability to a set of practices to be delegated to digital artefacts. Either to shorten waiting time or avoid the fear of missing one's turn by keep track on the line progression. Failing to recognise the variety of reasons people might have to participate in sharing events might reduce some of the attendees' interest in taking part in sharing events.

To sum up, the sensitivities above are meant to trigger reflections on how various queuing mechanisms can reflect concerns beyond simply getting people through a queuing system. Queuing can be instrumental to communicating goals and values of the community, creating a social space to meet new people, or to negotiating 'fair' sharing between attendees. As noted, fair relates to everyone's possibility to collect food items, rather than simply indicating norms of first come, first served.

Design considerations about these issues concretely move the focus away from efficiency and time to viewing queuing as an opportunity to educate about food waste and to build a sense of community among members. Building awareness and community around surplus was a central value and motivator for most volunteers, therefore designing digital queuing mechanisms that may support such values (education, knowledge exchange, connection) is an important challenge. With this is mind, designing digital artefacts that would, for example, solely support a model of fairness or minimise waiting time could have consequential effects on the attendees' engagement with community values and the volunteers' willingness to engage in voluntary work.

7 CONCLUSIONS

This paper has presented design work aimed at re-configuring queuing practices at face-to-face food-sharing events. Past work on food-sharing and HCI has outlined the role of digital technologies in structuring relationships between food donors and recipients [15, 22, 53], or the role of queuing at face-to-face events to manage the flow of attendees during and before food distribution [2]. This paper furthers this research area by exploring how values, not directly connected to everyday experiences of waiting (i.e., standing in line at supermarkets), can play in re-framing the role of digital technology in supporting queuing practices. Avoiding polarised narratives of efficient and socially rich sociotechnical queuing practices, the analysis has illustrated the changing configurations of values, technology, and the community's concerns that shape how queuing can be organised.

Rather than suggesting designs of queuing practices to be replicated at different sharing events, our results point to a need for flexibility and for considerations of the many aspects that might determine how queuing is configured. Dealing with emergencies, such as not having enough volunteers or not enough food for an event, or having to restructure food collection under the Covid-19 pandemic, are common challenges for the volunteers. To allow for this flexibility, and to support activists in developing their own configurations of queuing mechanisms, we have outlined four sensitivities that invite reflections on the who, where, when, and why of queuing in the context of volunteer-driven initiatives.

The workshop was limited in terms of participant attendance: a larger group could have provided additional ideas to further develop digitally mediated queuing. Moreover, although the first author extended the invitation to participate in the workshop to event attendees, the majority of participants were active volunteers of the organisation. As a result, the design considerations produced by these participants may be biased towards the vision and mission of the organisation. Future engagement with the community will be planned to take place during the events to ease attendees' involvement in the design work.

In compliance with Covid-19 restrictions, all food-sharing events have been suspended. Once restrictions are lifted and events have resumed, the first author plans to return to the field. In this future work, the author and community members will *act* [30] on the design considerations planned in the workshop through in-situ prototyping and testing of digitally mediated queuing mechanisms. Following the action phase, the author will engage with community members to *reflect* [30] on the new queuing mechanisms to assess if in practice, they may help to communicate activism, encounter others, and create more transparency, or if they also lead to unintended effects such as confusion or cheating.

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