Investigating the use of digital artifacts in a community project of sustainable food practices: 'My chili blossoms'

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ABSTRACT

Research on food practices has become more common among scholars of HCI in recent years. Human-Food-Interaction (HFI) looks into the interplay of humans, food and technology. HFI, even so, has paid relatively little attention to the more collective elements of food practice, including social bonding [1]. The modest project we describe below aimed to say something about the use of digital artifacts to support community engagement for sustainable food practices. We participated, as action researchers (see [2]) in a grassroots movement that instigated a project around learning about food growing, using digital means to bring interested people together during times of physical distancing: In the project *Vegetables seek a home,* people from various backgrounds 'adopted' a chili-plant, they are invited to share what they like in a Telegram-Group, and to get learning-modules via a mailing-list. Through an analysis of the communal effort to actualize the project (video-calls, Telegram, wechange.de) and the content of the Telegram-Group for the chili-plant adopting parents and experts, we suggest some design implications for grassroots communities and sustainable food practice. In future research we intend an iterative design to support the community and its project, utilizing Holmgren's 12 principles of permaculture design.

CCS CONCEPTS

• **Human-centered computing**; • **Human computer interaction (HCI)**;

KEYWORDS

Food, HFI, Sustainability, Sustainable HCI, Community, Grassroots, Learning

1 INTRODUCTION

In the context of the increasing interdisciplinary interest in the human impact on climate change, a subfield of Sustainable HCI (SHCI) has emerged, aiming to support small scale but high impact approaches to both consumption and production practices. These contrast with governmental regulatory approaches and top-down market-based initiatives. Grassroots initiatives promise to facilitate understanding and promote change in practices towards sustainability [3]. In this paper we present our action research with a local grassroots movement supporting sustainable food practices, addressing one of its specific projects, in which young chili-plants are given to people who can then join a group-chat on the instant messenger service, Telegram, and get learning-modules via a mailing-list. The project was developed in online meetings during the Covid-19-crises and aims to ameliorate feelings of isolation through involvement in a community of interest, sharing knowledge on sustainable food practices, and learning how to care for a plant, harvest its vegetables and in so doing, preserving genetic diversity.

In this context we address the research question: *What role do digital artefacts play in community engagement in sustainable food practices?* To answer this question, we used an action oriented research approach and analysed the communication of grassroots movement in video-chats, the instant messenger Telegram and the

platform wechange.de as well as the Telegram-Group dedicated to the project. In this short paper, we address a research gap, which has to do with the lack of research into social affect within HFI. We contribute to the wider field of (Sustainable) HCI by providing some broad design implications for localized small efforts which might ultimately provide global lessons. Furthermore, we aim to inspire HCI scholars to participate in the efforts to expand socio-informatic inquiry into permaculture design.

2   RELATED RESEARCH

For the related work we present the shared field of Human-Food-Interaction, Sustainable HCI and grassroots-movements. Human-Food-Interaction (HFI) is about understanding the role of digital artifacts within the interplay of humans and food. We argue, that the technology-centric focus, which currently dominates research within HFI [1] needs to be widened by more investigations into cooperative aspects. Existing studies tend to be 'persuasive', for example through chatbots for diet change [4], but here we are more interested in a human-centric viewpoint which looks at how practices can be supported organically and how meaningful engagement into a community of interest can be supported. The few existing examples of such an approach include, for instance, Ferdous, who takes a 'celebratory approach' to family consumption practices [5].

In Sustainable HCI so far a 'persuasive' perspective on rational [6] and sluggish consumers has prevailed, lacking a wider, social context [7], but simultaneously practice-based research has emerged, shedding light on [8], for example, food waste [9] and food sharing [10]. Knowles et al. have shown that the previously obvious boundaries of social, environmental and economic SHCI are no longer relevant, while determining sustainability and the role of SHCI addressing it is in an ongoing debate [11]. Hirsch et al. [12] argue that investigating small-scale food producers is at the heart of the sustainable HCI debate [13], [14].

Balestrini et al. [15] concluded that HCI needs to move beyond novelty and short-term deployment and instead work towards a technology transfer that empowers communities in the wild and supports long-term change. This, of course, is another sense in which we can talk about sustainability (also see Meurer). Our research draws on notions of community of practice and community of interest [16]. In so doing we are stressing aspects of engagement through mutual learning [17]. Striving to enact economical, ecological and societal change, grassroots movements are a source for innovation as well as they have power to mobilize resources necessary for transitions towards sustainability [18], [19] and HCI can play a role in supporting in identity building, facilitating collective action and supporting community engagement [20].
next subsections provide instructions on how to insert figures, tables, and equations in your document.

3   RESULTS

Below, we present our preliminary findings following our involvement [21] with the grassroots movement and its project, looking at the role of digital artifacts in community engagement. Therefore, we focus on the current phases of 'preparing' and 'performing' the project.

3.1   Grassroots-movement initiating a project

Siegen isst bunt (Sib; in English: Siegen eats colourful) is a local grassroots movement in a German city that organizes communal projects and events around sustainable food practices. The community of Sib has strong connections to the 'Foodsharing' movement that supports food saving and sharing practices utilizing a platform [10]. Even so, Sib wants to expand the scope of sustainable food practices towards urban gardening, communal cooking and food literacy. Over about 4 months around 7-10 people regularly organized events, met for discussions and planned projects in a living lab (see e.g. [22]) which had open, pluralist, intentions. Two workshops about the vision of Sib in the living-lab pointed to a need to foster connections within the community through mutual learning and to be inclusive by sharing knowledge with others, especially to bring different generations together.

After several events, like communal cooking from saved food or a seed-sharing market, as well as a number of meetings to coordinate and plan, Sib had to stop physical meetings due to the Covid-19 outbreak. Therefore the weekly meetings at the living-lab were held instead via video-chat. Therein the project-idea of 'Gemüse sucht ein Zuhause' (GseZ; in English: vegetables seek a home) emerged. The project provided an impetus to improve Sib's communication structure in order to make community engagement as inclusive as possible, especially to support intergenerational learning.

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A participant of Sib suggested to use Wechange.de, a cooperatively owned, open source tool combining 22 functions for project management and networking, mainly used by communities engaged in sustainable practices. Subsequent use, however, was variable. The platform was not widely used, because of a learning 'overhead', though participants continue to test its functionalities.

The instant-messaging-service Telegram was much more widely adopted. The use of Telegram within Sib was already commonplace for most participants, and it became a default application for text, voice messaging and pictures in a group chat. Files were shared, tasks were coordinated and meetings scheduled. Telegram and Wechange.de were therefore in competition with each other in terms of coordination and organisation. Although Telegram is used by a lot of people on a daily basis, it lacks certain functions which created some frustration.

3.2   The Telegram-Group of the project

To understand how the participants engaged with the emerging local community of sustainable food practice we analyzed the projects' Telegram-group. More specifically, we observed how the 41 participants engage in exchanging things and services as well as sharing of experience and expertise, in an open fashion.

Unconditionally exchanging things and services: There was a range of goods and services that the community members started to exchange without expecting anything in return. At the beginning of the Telegram-Group the researchers asked the participants within the group-chat how they wanted to use it. The following statement of Participant 1 shows that she intends to search for a service, but is unsure if this is the purpose of the group:

"*Dear everyone, today I come to you with a request that does not directly concern the chillis. If that's not okay, then just delete it or ignore it: My husband and I (...) have our first garden, which is unfortunately really in bad condition. Unfortunately, we lack experience and knowledge how to get it back in shape again. (...). Now my question to you: Someone has lust/time/experience to share his/her knowledge with us and to think about how to use the garden/beds in a meaningful way (...)?*" (Participant 1).

In reply to this inquiry Participant 2 recommends: *"I'm also getting my first garden and watching YouTube. I will send you a personal message."*. In turn, two initiators of the project contacted Participant 1, visited her garden and gave her garden design recommendations.

Another case of exchanging services is Participant 2 offering her writing skills for the community of Sib:

"*Are there actually public relations people responsible for this action (project)? Should it be advertised at all and should everyone diligently document the progress of their plants? I have a nice, rather short text which I would provide if there is interest in it. (...)*" (Participant 2).

One of the initiators replied that "*there is no one in charge!*", because the project is done by volunteers. The text was afterwards shared in the Sib community and used for public relations. In the other cases of exchange, participants' requests or offers referred to seeds, shoots or plants.

Sharing experience and expertise: It is not surprising that a sharing of experience and expertise via text and photo took place in the group-chat. Yet the cases outline the role of digital artifacts within mutual learning. Participant 3 frequently reports about events like travelling with her chilli, "*My little devil and his tomato buddies are on vacation on (German island)* 😎", and the development of her chili by sending photos and short text like "*My chili blossoms*". In one incident she reports that her chili plant broke and shares one of its last pictures, "*Probably the last photo.* 😢". A project initiator shares that she had also broken a pumpkin plant recently. Another project initiator adds that this pumpkin stem was fixed by using clear film and shares a picture of the bandaged pumpkin doing well.

Sharing pictures plays an important role in communal learning. Participant 4 states: "*Now that I have seen the other chilies, ours is clearly curling, or rather the leaves... what is the reason for this?*". This evokes Participant 2 to guess: "*bad genes? happens to the best...^^*". As a possible reason, an initiator points to the water balance of the plant and gives further advice. Another initiator asks Participant 4 to check the plant for aphids, and indeed she reports that she found some, took them off (method unclear) and askes "*Is there anything else we can do?*". Participant 3 suggests: "*(. . .) sprinkle with soapy water, but nettle liquid manure also works, but it must stand for about 10 days*", leading to a discussion on how to use liquid manure. Other participants report their chili to be fine or to have aphids as well. The theme of 'aphids' is therefore represented in the first learning module. In addition, this example also relates to one of the main themes of the project: intergenerational learning. Even though some older adults actively took part in the Telegram conversation (for example, the participant whose chilli broke), half of the older adults in the project did not. Nevertheless, caregivers in two retirement homes joined the project to stimulate interest.

One of the experts introduced a 'pad' to the group-chat to communally collect questions to help her doing the monthly learning-modules. In this context Participant 3 asks "*Is this also the pad to express needs wishes to this group? :)*". Negotiation and its documentation around the groups purpose seems to be important to most active participants. Before the design of the first module 19 questions were collected in the pad, but no concrete expression of needs could be found, although Participant 3 got a "yes, please!" from one of the initiators. The first module has been sent via a mailing-list.

4   DESIGN IMPLICATIONS AND FUTURE WORK

It is a necessary feature of daily life that we have to eat and drink. Nevertheless, it is apparent that, for most people, eating and drinking is rather more than just necessity. Food consumption is oftentimes a collective behaviour, in families and elsewhere, creating forms of solidarity [23]. Food also plays a crucial role in respect of economic and environmental issues. The global food chains have revealed weaknesses during the Covid-19-crisis [24], increasing the already existing mass of food waste and simultaneously threatening consumers with supply shortages. An IPCC [25] special report about climate change and land usage estimates that the global food system is responsible for 21-37% of total net anthropogenic GreenHouse Gas emissions. To tackle these global issues, local grassroots-movements take up responsibilities for sustainable food practices in their region to expand its scope from various locations towards

global impact. Our study demonstrates that small communities of this kind tend to be open, flexible and a non-hierarchical approach works well, though whether it can be scaled remains to be seen. In any event, we argue for a long-term but small scale approach to permaculture design, based on principles of mutual learning and an orientation to practical activity. Design, we argue, should reflect small, local needs. Learning the functionalities of communication technology at scale is not a primary focus and did not for the most part succeed. Design needs to make small localised efforts count. Food opens design space which encompasses social, economical and ecological issues, presenting a more holistic opportunity to understand the communal drive for sustainability.

Permaculture is a grassroots movement addressing agroecological practices. Its ethics and design principles have been used to inform Sustainable HCI because it can provide permaculture principles to inform local social affairs. We will invite a social permaculture designer to expand this work and lead a permaculture design workshop with the participants of GseZ to address the socio-informatical environment of the project. For example, we want to utilize the 8th permaculture principle of 'integrate rather than segregate' to reflect on supporting intergenerational learning.

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