
UbiComp for Grassroots Urban Food-Growing Communities

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Abstract

In this paper we argue that research into ubiquitous computing for sustainability must move its focus beyond designing for individual consumer behaviours. Urban grassroots food-growing communities offer opportunities to learn about the role of participation, community, citizenship and collective action, where sustainability encompasses environmental, social and economic factors. We report on fieldwork at an urban community farm in east London, and initial trial of the Talking Plants Sale prototype, to support the values of the farm.

Author Keywords

Sustainability; human food interaction; urban agriculture; participation; community; collective action; grassroots; sustainable HCI

ACM Classification Keywords

H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

Introduction

Due to the environmental crisis, there is a growing body of research that looks at the connection between ubiquitous computing and sustainability. These have a broad dominance on individually-focussed persuasive applications or "green" products (see [6] for an

overview). We agree with [5] that the global environmental crisis is as much a cultural problem as an engineering one, and therefore research must engage with questions of how we understand society, “and our role in it as consumers and makers of things.” [5] We argue for a shift in focus for designers interested in issues of sustainability away from the individual consumer, towards the possibility of collective action, citizenship and community. To this end our research engages with grassroots urban food-growing communities. By researching how ubiquitous technology can support the shift from individual consumers to small-scale producers of food engaged in collective action, we aim to contribute to the creation of opportunities for participating in more sustainable behaviours.

The problem of focusing on individual behaviour change

By framing the problem of sustainability in terms of individual moral choice over patterns of consumption, we risk the “downgrading of political participation to everyday consumption (in which one operates merely through a limited series of choices offered by the market)” [7]. This also implies that sustainable behaviour is limited to those who can afford it (e.g., to buy organic produce). As [1] argue, these typically fail to take into account the systemic cost to the environment, or that there may be equal or better solutions that do not use computational technologies.

Recently it has been argued that what is required is a fundamental rethinking of design, and an understanding and shift in cultural thinking [5, 7, 9, 10]. For example, in the specific context of food production and consumption, the relatively recent

separation between agriculture and the city is, “steeped in the cultural narratives of modernism. These narratives have included: the conceptualisation of natural resources as unlimited, the belief that technological solutions come without side effects, and the idea that nature and natural processes are somehow dirty and undesirable” [10]. As researchers we must examine our own understandings of such cultural narratives or we risk unnecessarily constraining the design space of ubicomp approaches to sustainability.

Food-growing and sustainability

A recent report of The World Health Organisation on urban agriculture found that the city of London requires the equivalent of the entire productive land area of Britain to sustain itself. The report finds that the ways in which London’s residents feed themselves are fundamentally socially, economically and environmentally unsustainable [16]. At the same time, communal and individual food-growing practices in UK cities is a rapidly growing phenomenon whose significance for communities is not fully understood or researched. The number of community gardens in England in 2010 was four times greater than in 2005 [13]. Allotment growing is thriving in Britain, with demand far outnumbering supply [12]. Urban food growing initiatives of the local authorities in the UK have also enjoyed a resurgence, for example through the Capital Growth 2012 initiative which supported the creation of 2012 new community food-growing spaces in the capital by the end of 2012. This suggests that urban food-growing presents a fruitful site for research.

In this paper we report on fieldwork at Spitalfields City Farm in East London. The research asked: What are the

values and needs of such communities? What are the implications and opportunities for designers to reflect and support these values? What can researchers interested in sustainability learn from grassroots, participatory cultures of urban food-growing communities?

In light of the increasing popularity, demand and importance of community food growing in London and other urban environs, the designing of ubiquitous technologies to support such practices has the potential for impacting on a number of important issues such as food security, social cohesion, health and wellbeing, urban sustainability and healthier local economies.

Related Work

Both [9] and [3] have articulated the virtues of researching food production and consumption within the context of HCI, with a focus on designing for more environmentally, socially and economically sustainable cultures. [2] looked for opportunities for interaction designers to design systems for sharing knowledge of sustainable food growing, including within urban food growing.

There are a handful of case studies reported in the literature. [15] describes an interactive voice application for small-scale farmers in rural India to provide interactive, on-demand access to appropriate and timely agricultural knowledge [15]. Seeds to Soil [18] is a grassroots urban food-growing project in Central Harlem that uses participatory actions and an online presence to address issues around community cohesion and food security. Visitors to a community garden can plant and take home a mystery seed,

before joining an online community where they can share information about their plants with people they have never met before, but who may be their neighbours. [14] explores the values, needs and practices of urban agricultural communities in Australia, and describes opportunities for designing with digital and computational technology to support these communities, thereby extending the scope of sustainable HCI. Our work extends these works, and in particular that of [14] by reporting on urban agricultural practices at a city farm in inner east London.

Methodology

We used a participatory design approach. The initial stages of the study involved 5 months of field work at the farm, from February to June. This included participant observation work, such as joining in the weekly volunteer drop-in gardening sessions. We conducted 20 formal and informal face to face interviews with staff and gardening volunteers. The formal interviews were audio recorded and transcribed. We also facilitated 5 creative participatory workshops adapted from participatory design methods such as contextmapping [19], future workshopping [11], and cultural probes [8]. The workshops were chosen and devised in order to establish close working relationships, stimulate creative responses, and access people's dreams, fears and aspirations, to inform the design of appropriate technological interventions.

Findings and Discussion

Findings indicate that the farm places a high value on community, inclusivity, participation, well-being, education and sustainability. Its environmental work not only includes food-growing and healthy eating



Figure 1: Information about gardening and cooking activities at Spitalfields City Farm

activities, but also involves capacity building by strengthening knowledge and skills within nearby communities, and an integrative approach to the management of food production and waste cycles. In order to do this it seeks to sustain itself financially and socially, through increasing its user base and keeping its constituent communities engaged. It takes into account economic, social and environmental sustainability, as well as education, health and wellbeing. We now discuss a selection of findings that are pertinent to the design of ubiquitous computing to support the values of the farm.

Efficiency is not a core value

Despite the plethora of commercially-available sensor-based products that either support automatic watering of plants, or let users know that plants need watering or a change in nutrients, our findings indicate that such automation systems are not in keeping with the values of the farm. Community members reflected that such technology is not reliable; creates more work in the long run; and compromises a connection between gardeners and plants. *"I bet you if a machine had sensed that they were like, oh, wilting, it would've said, dig 'em out. It was just me, the human, thinking well I'm going to leave it, and two weeks, and look at them now"* (P4). This chimes with findings in [14] that such systems remove opportunities for building relations between experienced gardeners and beginners through "social interaction and informal transfer of tacit knowledge".

Many people don't use smartphones

The farm's users are diverse in terms of language, age and socio-economic background. Many do not use mobile phones, let alone smart phones. As inclusivity is

one of the major values of many grassroots urban food-growing communities, the danger in designing for pervasive or mobile computing is that large sections of that community may be excluded from the design. There may be greater opportunities to embed computing technologies into everyday objects in such a way that their operation does not require prior technical knowledge or access to a smartphone.

People value face-to-face communication

Gardening offers people the opportunities to get together and engage with other humans face-to-face. It helps build a sense of community, which is linked with subjective well-being [4]. One volunteer described volunteer gardening at the farm: *"[It] was kind of also a way of me getting out of the house, because... I was getting kind of... discouraged about...not getting [job] interviews...so it was a way of...structuring my day a bit more too so that I wouldn't be stewing over things and just filling applications all day long. It was good to be outside interacting with people"*(P3). Designers must be careful not to design away opportunities for face-to-face connections, serendipitous encounters and shared activities in co-located space.

The farm offers opportunities for participation

The farm, like many other community gardens, fosters a culture of participation and collective engagement. Through its policies of inclusion, its varied activities programme, and its capacity building in the local community, it offers many levels at which people can get involved and start to change their environment, their communities and their selves.

Talking Plant Sale

One of the concepts generated in the participatory design process was for an augmented plant sale. The first prototype was tested during the international Fascination of Plants day, at Spitalfields City Farm. Visitors to the farm could approach the plant sale and use an augmented watering can to hear the plants talking. Six different plants tell you about their medicinal qualities and try to convince you to buy and care for them. The plant voices come from the volunteer community, reflecting the cultural diversity of the farm.

This project uses ubiquitous technology to support the farm's values of community, participation, communication/education, sustainability and well-being.

Future plans for the project include collecting plant knowledge such as cultural knowledge around plants, seed legacy, growing knowledge and recipes. A website

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will eventually complement the tangible everyday objects, and allow people remote from the farm to contribute their knowledge and experience of growing different plants.

Conclusion

Design is informed by the cultural narratives we tell ourselves – of natural resources being unlimited, of technological progress, of the separation of technology from politics, of the unstoppable nature of free market capitalism, and of the incompatibility of agriculture and urban space. The current global economic and environmental crises demand a change in these cultural narratives. By working with grassroots urban food-growing communities we can observe these changes in action. Because of their values, the way they are run, and the activities they offer to all, which help strengthen the links between collective action, participation and citizenship, they present a site where such shifts can begin to occur. It is our job as designers to support and strengthen these shifts.

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