Towards a concept of community artifact ecology in HCI?

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Abstract
In this paper we introduce the concept of community artifact ecology. We argue that taking a community perspective on the concept of artifact ecologies is relevant in HCI because communities are also dealing with multitudes of artifacts, in ways different that individuals, organizations or workplaces do. This has implications on understanding how to research and design HCI for communities but also on refining the ecological perspective in HCI. We look in particular at examples from preliminary research on a local self-organised urban community and discuss what existing concepts in the ecology literature are relevant to consider and how they change with the community perspective.

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Artifact ecology, communities, place, self-organization

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H.5.m [Information interfaces and presentation (e.g., HCI)]: Miscellaneous.

Introduction
In our research on and with local urban communities, we have noticed that similarly as with individuals, communities also are dealing with an ever increasing proliferation of digital artifacts. These are shared artifacts

that exist is communal spaces, whether physical or virtual, temporarily or more permanently. They are also the community members own devices and applications that they invest and share as much as they invest their personal time for the communal good in everyday activities. In this paper, we introduce the concept of community artifacts ecology, which brings in the community aspect to the existing artefact ecology concept in HCI that has so far focused more on the personal level[5, 2]. We also draw connections with the information ecology concept earlier introduced by Nardi & O'Day[6]. We see a community perspective as a relevant direction for further research into ecologies in HCI because it brings forward issues related to the ownership of and control over artifacts, as well as insight into a more sustainable approach to artifacts and the possibility to make them work together, rather than aiming always at designing new ones.

The kind of communities we are interested in have a connection to a particular urban locality. This may be anything from an urban neighborhood (e.g. [3]) where the locality and shared sense of place characterises the community, self-organised communities around particular local issues, or the more formalised housing organisations and associations involving resident democracy. These local urban communities are not only bound by the geographical dimension - so they are not simply communities of place - but they also share interest in specific issues (e.g. sustainable living or concerns about the neighbourhood), and have either established or emergent practices in the way communities of practice do[7]. For our research perspective we cannot remove the aspect of place, interest or practice from our working definition of a community.

We are interested in how the community ecology is shaped and how the members negotiate and appropriate new and existing digital artifacts. In particular, we want to understand the interplay between place, the shared community technologies, the community members' own technologies and the practices that exist, develop, or are challenged by these technologies.

Initial observations

We are currently performing preliminary observations and interviews of an emerging self-organized local organic food community in Aarhus, Denmark. The community started late 2010 with some individuals wanting to find a cheaper and sustainable way to get fresh local organic food. To become a member of the community, one should pay a membership fee and contribute with three hours of practical work per month. The local farmers deliver the goods every thursday afternoons to a local residents activity house used by the community. There, members who have signed for the packing shift will pack the goods in individual bags. Later, members who have signed for giving the goods and registering new orders will interact with those who come to collect their bags, place new orders and pay for these.

We are still at the beginning of our empirical research, but from our observations we see that at least part of the communitys artifact ecology consists of different software-based artifacts that enable the community to 1) communicate information through a website, Facebook and mailing lists, and 2) organize themselves, e.g. with Google docs and spreadsheets. Another aspect of the community artifact ecology comes to life on thursday afternoons at the local residents activity house. First, there are the physical devices that get set up for the occasion: a shared laptop that one of the members has given for shared use by the community, which gets connected to the communitys credit card terminal. The

Wi-Fi of the residents activity house is used for connecting to the internet. The laptop is also used to check the orders and ad hoc tasks, such as checking membership info. However, this configuration of devices, software and infrastructure that are provided by the community is not the only one. For instance, when the existing Wi-Fi is down, the community members responsible for taking in the payments have used their own mobile internet connections to connect their laptop to the shared credit card terminal. Thus, the community artifact ecology can be seen as composed of 1) devices that either the community owns or the personal devices of the members of the community that are put to common use, 2) infrastructure (e.g. Wi-Fi or mobile internet connection), and 3) software that is owned by the community or a member of the community (e.g. their own website) or by a commercial provider (e.g. Google docs). The community artifact ecology can be seen to exist in some kind of stable state in the background and parts of it are activated through use either by individual members or by groups of them. It is also dynamic and shaped by the use and adaptation of existing resources (design-in-use) by members of the community, either as a way to respond to the challenges of a particular situation, or because of scarcity of financial resources or technical know-how.

A community look on artifact ecologies

These observations have lead us to consider the idea of a community artifact ecology as a way to conceptualise how communities work with and are supported by technology. Our motivation for exploring the idea of a community artifact ecology is based on a realisation that we should move beyond designing new and/or monolithic systems, especially when HCIs focuses widens to include designing for and with emerging and self-organised communities. The artifacts, whether devices, software or infrastructure are already out there and people are dealing with them.

We hypothesise that place plays an important role in our research, and here we find inspiration in Nardi & O'Days concept of an *information ecology* and Bells *cultural ecology*[1]. By placing the ecological perspective in particular local environments and analysing both their particularities and commonalities, provide a good perspective to our own observations. Juxtapositioning this with Jung et al.'s concept of a personal artifact ecology[5], allows us to include instances where members of the community invest their own personal devices, and share information across technologies that are strongly tied to their personal ecology. Combining the two perspectives of the place-sensitive ecology and the personal one also takes into consideration mobility in and across ecologies, especially with the recent proliferation of mobile technology. Bødker & Klokmose[2] have further developed Jung et al.'s[5] personal artifact ecology by taking an activity theoretical direction. The authors focus on the dynamics of an ecology as it unfolds around the introduction of new artifacts and argue that the personal artifact ecology moves through different states (stable, unsatisfactory, and excited). This approach is particularly relevant on the community level. Forlizzi[4] discusses this from a product ecology perspective; how new technological artifacts such as robots change the existing practices and the role of other products in the ecology. Thus, the dynamics of the artifact ecology are played out in a socio-technical context: 1) the more capable peers play a stewarding role when ones personal artifact ecology undergoes changes; peers may even trigger a sense of dissatisfaction with one's personal ecology[2], and 2) new products change the perception of and the actual configuration of the product ecology, where new artifacts push older ones out of the ecology[4].

We also find that by bringing a community perspective to the existing literature on ecologies reveals some interesting issues. From the very focused localised perspective of Nardi & O'Day, we get the sense that we participate in different ecologies throughout our life. However, we also need to understand what happens when we move between ecologies and what we bring along, experiences and artifacts alike. This also points to issues related to control. A majority of the ecological perspectives present ecologies that are under the control of the individual and/or the institutions. When taking on a community perspective, who controls, owns and defines the ecology becomes less straightforward. Is it key individuals at the 'center' or is it a shared (democratic) decision that defines the ecology? Or is the artifact ecology negotiated through ad hoc appropriation of new technologies by specific members during particular activities?

Finally, we find relevant to investigate instances where parts of the ecology are imposed upon the community. This can happen from within, where a single member defines the ecology either by having the expertise to configure a particular subset, e.g. a web forum, or because he or she initially identifying a need. We also see it happen from the outside, when communities need to interface with public institutions and other communities. Getting a particular permit to handle foodstuff, could mean that the organic food community is required to use a specific platform in the application process and later management, which in turn may cause instabilities to the community artifact ecology.

Discussion

We hope to bring to the workshop the following issues for discussion: What can we learn as HCI designers and researchers from the way self-organized communities shape their artifacts ecologies? For example, what is the role of sharing, adapting, or making with what is available, often with limited resources? What are the "implications for design"? How can we work with self-organised communities and support them?

References

[1] Bell, G. Making sense of museums: The museum as' cultural ecology'. *Intel Labs 1* (2002).

[2] Bødker, S., and Klokmose, C. N. Dynamics in artifact ecologies. In *Proceedings of the 7th Nordic Conference on Human-Computer Interaction: Making Sense Through Design*, NordiCHI '12, ACM (New York, NY, USA, 2012), 448–457.

[3] Carroll, J. M. *The Neighborhood in the Internet: Design Research Projects in Community Informatics*, 1st ed. Routledge, New York, NY, 10001, 2012.

[4] Forlizzi, J. How robotic products become social products: An ethnographic study of cleaning in the home. In *Proceedings of the ACM/IEEE International Conference on Human-robot Interaction*, HRI '07, ACM (New York, NY, USA, 2007), 129–136.

[5] Jung, H., Stolterman, E., Ryan, W., Thompson, T., and Siegel, M. Toward a framework for ecologies of artifacts: How are digital artifacts interconnected within a personal life? In *Proceedings of the 5th Nordic Conference on Human-computer Interaction: Building Bridges*, NordiCHI '08, ACM (New York, NY, USA, 2008), 201–210.

[6] Nardi, B. A., and O'Day, V. L. *Information Ecologies: Using Technology with Heart*. MIT Press, Cambridge, MA, USA, 1999.

[7] Wenger, E. *Communities of practice: Learning, meaning, and identity*. Cambridge university press, 1998.