

The boundaries of ubiquity

Wendy March, Tony Salvador, Steve Barile, Saddam Khattak, John Sherry, Richard Beckwith*,
Anne P. McClard^

*Intel Corporation
211 NE 25th Ave
Hillsboro, OR 97124 USA
+1 503 264 7504
wendy.march@intel.com

^blue.zebu
287 NW 93rd Place
Portland, OR 97229 USA
+1 503 780 3743
anne@bluezebu.com

ABSTRACT

This poster discusses new meanings of boundaries relevant to ubiquitous computing within and between the physical and the virtual worlds. Ubiquitous computing, whose tenets are to make computing invisible and to blend the physical and virtual, also generates many interaction design challenges. We discuss one: the maintenance and management appropriate for, and explicit boundaries between, the physical and virtual worlds within a *physically* based community. We present a simple technological intervention revealing novel boundary characteristics that must be considered for the design of ubicomp applications.

Keywords

Community, boundaries, local, design, probe.

INTRODUCTION

From a technical and social perspective, boundaries have been considered in several contexts. Nippert-Eng [1] established a set of conditions under which *individuals* maintain strong and weak boundaries between their work selves and their home selves as mediated in large part by the *physical* world. Bly et al. [2] discuss how open media spaces between and among *workgroups* extend the *physical* boundaries of the workplace itself while implicitly maintaining the boundary between insiders and outsiders. It is common knowledge that entirely *virtual communities* erect boundaries to prevent intrusion by other *individuals* who also inhabit the virtual space. Benford et al. [3] discuss three dimensions (transportation, artificiality, spatiality) necessary to consider *mixed reality* boundaries. Their aim is to make transparent the “natural” divisions between physical and virtual worlds amongst a *group* of people with a shared collaborative goal.

In our work, we’ve uncovered the condition in which the community of a coffee shop – whose boundaries are largely determined by the physical space of the shop – are being

forced to extend into the virtual space. In this case we are defining the community as all the users of the shop, though they are in fact members of many different communities and affinity groups. However, the people themselves are loathe to extend their community into unregulated cyberspace. These conditions, which will undoubtedly become increasingly prevalent as ubicomp technologies roll out, require new technologies to make, manage and enforce appropriate boundaries.

Probes in Place

To explore issues of community building and ubiquitous computing, we’ve embarked on a long term relationship with a coffee shop in Portland, Oregon: Urban Grind. Our involvement includes ethnography, participatory design and probe-based technological intervention [4]. The proprietors of the shop explicitly wished to develop a unique community of people around the shop. They situated their shop in a place away from passing foot traffic, in a largely industrial setting, relying purely on word of mouth. A community of people is developing and they don’t even have a sign in front of the shop. Urban Grind sees technology as one method to build community, and offers their customers free Wi-Fi access. To further explore the potential influence of technology on community building, we are planning a series of Technology Probes [4].

CowCam Probe



On the counter of Urban Grind is a small tableau of two plastic farm animals: a pig and a cow. Included in this tableau are an ever-changing set of “props”; some blue weathered glass or a coffee cup. Customers and workers

are free to rearrange pig and cow, and had been doing so for months before our arrival. For this “probe” we have added a small camera, a viewing screen and a large plastic button on the counter to create CowCam. By pressing the button people take a photograph that is pushed directly to the UGCommunity.com website, where captions can also be added to each image.

Community Boundaries

As simple and trivial as CowCam appears, it offers a series of challenges, especially those relating to boundaries. In the case of Urban Grind, rather than eliminate boundaries, we find it necessary to manage community boundaries based on the physical constraints of the coffee shop – in which pig and cow reside – and the virtual world in which they (the community, along with pig and cow) now find themselves. First, the issue isn’t from an individual perspective, but from a community of people establishing a boundary to protect their whole community from intruders. Second, the boundary is one between the physical and the virtual rather than the collision of two virtual worlds. Third, the community (and especially the community gatekeeper) wishes to use CowCam to deepen and enhance their community rather than to attract casual or virtual passers-by. That is, the community wishes to superimpose a virtual layer over its physical space, and to maintain the primacy of the local, physical space while not requiring access and maintenance activities common to the virtual, but which are acculturated implicitly in the physical.

Few researchers have considered implicit inclusion and exclusion based on physical access and whether the individual is physically or virtually present. A café is a casual place, and even if most of the customers are “regulars” and explicitly recognized and greeted by those behind the counter, no one registers or logs-in when they come to Urban Grind, and nor would they want to. Being in the shop provides access to CowCam and appropriate behavior is ensured by the scrutiny of the owner and the other customers. However the ability to add captions to those photographs from the website has raised many design issues. We wanted the design of the system to reflect the fact that when people take their coffee back to their office they are still part of the Urban Grind community. For now we have decided to allow comments to be anonymous, and we have no registration or checking mechanism. We considered only allowing comments while physically within the cafe (on the subnet). We also considered issuing cookies to laptop users whilst they were in the café, but rejected that idea too as we recognized that many of the customers didn’t bring their computer. Other ideas have included using a quiz based on knowledge of the physical space to allow access to the virtual space, and that may be a solution we use later.

The proprietor of Urban Grind was quick to notice that as soon as the small screen was added people were no longer just creating a tableau with Pig and Cow, to be viewed at the counter; instead they immediately began considering the screen. The image was more interesting to them than the physical representation, but as the website had not been publicized, it was the virtual within the boundaries of the café rather than the view of the virtual community via the website that was the draw. At issue here is the utilization of the virtual to foster the physical. We have just installed a large plasma display with a bulletin board application which includes images from CowCam. We intend that by displaying the images in the physical space, we will refocus attention back into the shop, and underpin the primacy of the local and physical environment.

Next steps

The website has begun to let the inside out of the space, but the outside has, so far, remained outside. By adding a large screen which can show content created on the website, we will be letting the outside into the space. This is raising the issues of content management and censorship once more, and we are again using the physical boundaries of the place to grant access. Content created in the space via CowCam, or the FlyerMaker (a simple scanner) will be immediately posted to the large display. Content entered from the website will remain in a liminal state until it has been approved. The purpose of our engagement is to understand characteristics of technology necessary and useful to community adoption. This is one element of a considerably larger study, and the probe discussed in this poster is also one of many.

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