Examining Appropriation, Re-use, and Maintenance for Sustainability

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Abstract

Within the past few years, the field of HCI has increasingly addressed the issue of environmental sustainability, primarily identifying the challenges and developing an agenda for designing for sustainability. Yet, the most difficult task remains, how do we develop realistic solutions when the digital ethos is based upon short-lived computing products that come and go at rapid pace. By examining appropriation, re-use, and maintenance practices, this workshop aims to identify sustainable interaction design challenges and directions in re-utilizing used or obsolete computing products for prolonged use.

Keywords

Sustainability, sustainable interaction design, obsolete, appropriation, re-use, maintenance

ACM Classification Keywords

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

General Terms

Design, Theory

Introduction

The field of HCI actively addresses the issues of sustainability through workshops, panels, SIGs [1-3], empirical studies [4, 5], experience reports [6], and design studies [7, 8]. Through various venues in which

the conversations are taking place, the role of HCI as well as the design challenges and agenda for sustainability are discussed and debated. Yet, one of the critical challenges that remains under-explored is identifying potential solutions for the dilemma everyday computing users are facing today – the seemingly inevitable path today's computing products follow to speedy obsolescence. In fact, obsolescence may have been planned as part of the marketing strategy [9]. However, the computing industry has become more conscious of sustainability, and is making efforts to come up with alternative solutions for providing more sustainable goods for the consumers [10], while finding alternative enterprise models to support such new thinking.

In this workshop, we aim to focus on a particular set of potential solutions for improving sustainability: appropriation, re-use, and maintenance of used and obsolete computing artifacts. The present HCI literature discusses these through examinations of user practices and empirical studies. Odom et al. studied how users preserve or discard artifacts [11] based on Blevis and Stolterman [12], Wakkary and Tanenbaum [13] illuminated users' creative reuse and renewal practices of digital artifacts, and Huh and Ackerman [14] studied prolonged use of an obsolete machine by a user community. However, the challenges and directions for how we might study, design, and evaluate the re-use of used and obsolete computing artifacts need further investigation. What is now needed especially, are guides to tangible action.

Devising viable ways for utilizing used and obsolete digital artifacts is often challenging for researchers as well as practitioners due to the limited capability and

ROI (Return on Investment) problem that is inherent in old digital artifacts. However, given that we have witnessed the recent flourishing of studies in appropriation and re-use together with the increasing need for designing for environmental sustainability, exploring design solutions for utilizing used and obsolete digital artifacts are crucial at this stage of the HCI field.

A challenge, as well as the necessary outcome, of the workshop would be then to devise realistic, practical, and creative ways in which what may be previously considered as e-waste can be transformed into sustainable goods. Examples include designing support mechanisms for user communities that can share maintenance expertise: transforming obsolete machines through re-appropriation; and designing infrastructure for users and institutions to exchange used computing products. These and other examples could then serve as inspiration for appropriation, re-use, and maintenance of objects and artifacts beyond the computing domain.

Workshop Issues and Goals

This workshop evolves from the well-attended CHI 2009 sustainability workshop[15] with a more specific goal in mind. **The goal is to progress from role identification and agenda building of HCI in sustainability to exploring action items in a potential solution space.** In order to further concretize the exploration, the participants will engage in a design activity session. Through the session and the following discussions, we strive to:

- Bring together the researchers, practitioners, and designers who are currently engaged in the activities of

exploring sustainable HCI or sustainable interaction design. Building on last year's CHI workshop, and by addressing appropriation, re-use, and maintenance of computing artifacts, this workshop further strengthens the sustainability community at CHI.

- Identify any challenges or limitations that hinder progress in sustainable design, specifically in reusing, appropriating, and maintaining used and obsolete digital artifacts. We hope that the diversity of the participants, specifically the gathering of researchers and practitioners, as well as their mutual engagement in the design activity sessions will identify unforeseen hurdles and challenges that would have otherwise been overlooked.

- Identify realistic, practical, and creative solutions to utilizing used and obsolete digital artifacts. Through the collaborative design activity session, the participants will brainstorm creative and innovative design ideas for prolonged use. Because the participants are engaged in the actual design process, the practicality and achievability of the design solution will be continuously examined. The participants will also experience design challenges, for which workarounds may be devised. The outcomes as well as the experience of the design process will inform concrete design suggestions for SID.

- Devise ways to evaluate what is a success in sustainable design for appropriation, re-use, and maintenance. How long is prolonged use, and how practical do the design outcomes need to be? How scalable should the solutions be? To which user groups are we suggesting the solutions for? How much are we willing to trade off negative outcomes of obsolescence (e.g., incompatibility) for sustainability? This workshop will strive to not only suggest design solutions, but also

devise ways to evaluate what it means to successfully re-utilize used computing products.

- Compile the outcomes into action items that may be helpful for the rest of the community. We will attempt to tie the outcomes of the workshop back to the rest of the CHI community by informing potential research ideas and practical applications. Also, we will tie in what other potential HCI research agenda in the CHI community can be applied under the frame of sustainability.

Audience

This workshop aims to provide a venue in which practitioners, researchers, and designers can inform each others' work and exchange ideas, participate in a collaborative design activity session, and discuss experiences from the activity session to inform issues of concrete applications in sustainable design. Given the theme of the workshop, any individuals who consider their work to be related to appropriation, re-use, maintenance, and prolonged use of computing artifacts are highly encouraged to participate. We also encourage participation from individuals with varied backgrounds and disciplines who are currently working on or interested in the issues of supporting sustainability through HCI.

Format

This one-day workshop will begin with the 15-20 participants' brief backgrounds and current work introductions. The workshop will then break into small groups and start brainstorming design ideas specifically in appropriating, re-using, and prolonging life of computing artifacts. Each small group will come up with design artifact, infrastructure, or supportive

mechanisms for user practice through the design activity. The participants will then present their design processes to the workshop. The workshop participants will together evaluate and discuss challenges of the design outcomes, and conclude with brainstorming actionable items for the CHI community and ways to disseminate the workshop outcome.

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