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Understanding the paradigm of disposable technology

What happens to old mobile phones?

Abstract We describe the first stages of a study geared towards understanding people's practices for replacing and disposing of mobile phones. In this position paper, we present early results of a web survey focusing on mobile phone ownership practices. Participant responses reveal a wide variety of practices that illustrate the difference between the *perceived* and *functional* lifespan of a phone.

1 Introduction

As ubiquitous computing becomes a reality, the number of personal handheld devices is exploding. Along with this increase in devices, we witness an emerging paradigm of "disposable technology" – technology that comes with the expectation of a short usage lifetime, despite the potential for a longer functional lifetime. In comparison to older, conventional counterparts, such as landline phones and stereos, consumers now purchase mobile phones, laptops, and mp3 players with the expectation that these devices will be replaced within a period of a few years. Several factors may contribute to this turnover; new technologies are developed, aesthetics evolve, and form factors become ever smaller. Iconic design, such as that of the Motorola RAZR phone and ever-evolving Apple iPod family prompt the emotional response described by Norman that draws consumers to a product [2]. New colors, sleeker designs, and added features may lead to the abandonment of older but still functional devices, and wireless service providers offer the latest model phones as a free incentive to renew a contract.

According to the 2007 U.S. Wireless Mobile Phone Evaluation Study by J.D. Power and Associates, American consumers keep their mobile phones on average for 17.5 months [3]. The fact that many devices in the new ubiquitous computing climate are acquired under the expectation that their span of use will not necessarily extend to the functional lifespan of the device combined with the rapid proliferation of devices presents an obvious problem for sustainability. As Blevis points out, such problems must be considered as a first-class issue in technology design [1] and not only as an issue of policy, engineering, or social practice. Possible ways of stemming the continued and increased proliferation of functional-yet-obsolete devices is to consider how devices can be designed in such a way that

users will want to keep them longer or at least engage in sustainable practices for replacing them. Modular design, add-ons for upgraded functionality, the ability to easily change the appearance of the device, or secondary functionality that make a device useful after it ceases to be used for its primary functions are some possible ways of improving the sustainability of devices.

To begin to address this issue, we are studying the reasons why people choose to replace their devices; our hope is that once we understand these reasons we can find ways to design them that address some of these reasons, thus prompting people to keep them longer. Additionally, we are investigating what people do with their old devices, both to assess the extent to which they are aware of or concerned about the disposability of their technology, as well as to perhaps find design ideas and inspiration for what can be done with obsolete devices based on existing practices.

2 Mobile phone survey

As a first step, we are conducting a survey specifically about mobile phone ownership in the United States and Canada to understand people's practices and reasons for acquiring and replacing handsets. We chose this as a first step because mobile phones are both extremely ubiquitous and also frequently replaced. At the time of writing, we have received 54 completed surveys and are aiming to collect answers from at least 100 respondents. We are using the survey not only as an information collection tool, but also to inform a set of semi-structured interviews that we will conduct to get deeper experiential data to inspire design ideas.

The survey seeks to understand some basics of mobile phone ownership, such as how many phones people have owned and how many years they've been using mobile phones as well as inquiring about their practices regarding selling, donating, throwing away, recycling, and giving away mobile phones. The survey is structured in two main parts. In the first part, we contextualize participants and get them thinking concretely about their experiences by asking them a set of questions about their current phone,

their most recent previous phone, and any otheophone that they have owned. In the second part, we ask questions about their overall experience with mobile phone experience, such as whether they have ever purchased a new phone, whether they have ever bought a replacement battery for a phone, whether they have ever recycled a phone or parts of a phone, and to tell us about an experience they have had in acquiring or replacing a mobile phone.

3 Perceptions and practices

At this point we have not conducted rigorous analysis on our data and are still collecting responses, but initial review of the answers we have collected thus far offers interesting insight into current practices and how people perceive their phones. One response was particularly reflective of the expectation of the short life cycle of mobile phones, indicating a duration of use dependent not on the functionality of the device itself but on a pre-determined replacement cycle: "The only time I replace a mobile phone is when the contract is up. I find no need to replace it otherwise. Every phone I purchase and enjoy its use until the contract on it is up." This comment perhaps suggests that the user perceives her usage pattern to be one that maximizes the duration of use of each phone and entails no more device replacement than necessary, although it has little to do with the functional life of the phone.

Although the survey inquired about a wide variety of potential practices and was (intentionally) not explicit about its sustainability focus, several participants expressed an awareness that their behaviors were problematic from a sustainability standpoint. In response to a question about whether they had ever discarded a mobile phone and if so, how, some responses were "I'm ashamed to admit that I think I've just thrown some out" and "yes, i think i threw one away a long time ago before i understood the environmental repercussions." Others, however, did not indicate awareness of the sustainability problems, answering simply, "yes. trashcan in the kitchen," or "Yes. I threw it away in my trash at my home in Chicago." In total, seven of the participants stated that they had at some point discarded a handset in the trash.

On the opposite end of the spectrum, others expressed the importance and joy of replacing their gadgets. When asked to describe an experience in acquiring or replacing a phone, some participants responded, "very pleasant experience. Getting a new gadget is always cool" and "I change my phone yearly or as soon as my contract expires so that I have the most up to date phone. I have always sold my old phones on Ebay."

Eleven of the 40 participants also informed us that they had at some point donated a phone, many of them to domestic violence shelters at drop-off boxes or phone drives. Five stated that they had at some point recycled

phones, and one participant stated that although she has not ever recycled a phone, she would like to in the future.

The most common practice by far, however, was to keep old phones. As one participant stated, "We usually hold on to the phones until they are ridiculously outdated." Twenty-three participants stated that they kept as many as five old phones in their homes, though many of them didn't know where they were located. When asked why they were keeping the old phones, most people stated that they kept them as backup or emergency phones, but there was a wide variety of responses, including, "Procrastinating in donating them," "just don't have time to discard them; I'm thinking that I might be able to still use them one way or another," "pack rat. I probably should throw it out," "I didn't want to throw it away, and I don't know where I can recycle it."

Thirteen participants stated that they had given phones away to friends, family members, or acquaintances and four people had sold their old phones in the past, but interestingly, every study participant was using a phone that was new when they had acquired it, either as a gift, purchase, or as part of service contract, with the exception of two graduate students who were using phones owned by their labs.

The surveys also revealed some practices of reusing or reappropriating the technology in creative ways that could be leveraged for sustainability. For example, one participant stated that she used her former phone as her current alarm clock, commenting, "like it because I can set it and throw it across the room. That forces me to get out of bed to turn it off in the morning." Another had repurposed old phones as conveniences for visitors, explaining, "When friends and family from out of the country visit they use an older phone with a pre paid SIM card so they are connected for coordination and emergencies."

4 Continuing work

At this point, we have not conducted extensive analysis on our data, but several preliminary conclusions can be drawn from the survey results thus far: many people are at least somewhat aware that disposing of old mobile phones in the trash has negative repercussions, and either have made an effort or expressed a desire to find other ways of disposal. It also seems possible that people keep their old phones in hopes that they will find other uses for them. We are continuing to collect data at this point and conducting ongoing analysis to derive possible

design implications and ideas from the existing practices and perceptions.

We are also using the surveys to identify potential interview participants to understand the people's phone replacement from a more deeply experiential perspective. One participant described the following experience, revealing a strong attachment to a phone:

"I loved one of my phones so much that I used duct tape to keep the battery attached when it would no longer stay on after I dropped it so much. It was an old phone, but it was the right size for me. I went on eBay and repurchased it, but after dropping that a few times, the battery would no longer stay on and I had to use duct tape again. After about a year of the replacement phone and replacing the duct tape almost every month, I gave in and bought a new phone."

Our hope is to understand stories like these and use them to inform and inspire the design of ubicomp devices that will help to break the disposable technology paradigm.

References

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