

Experiential Outcomes of Long-Term Use: Five and a half years with a Research Product

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In this position paper, we offer a brief overview and summarize findings from a unique case of one study participant living with a research product, called *Olo Radio*, in a field deployment study that lasted for five and a half years. The trajectory of experiences that unfolded over this long-term timeframe included: settling into everyday life, noticing renewed value in on human-data relations, life stage changes and adapting to new home environments, and, an emergent practice involving making one's digital history their own through a novel invention. Our aim in summarizing these outcomes across this 5+ year period is to offer a rare glimpse into how experiences with a research product that is designed to last over time may unfold, be sustained, and lead to new practices. We conclude with open questions about research products and time that we hope to discuss and reflect on further at the workshop itself.

CCS CONCEPTS • Human-centered computing → Human computer interaction (HCI); Interaction design process and methods.

Additional Keywords and Phrases: Research through Design; Research Products; Slow Technology; Field Deployment Study.

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1 INTRODUCTION

The kinds of questions that HCI researchers are pursuing continue to expand. The focus of a growing portion of the HCI community has moved beyond designing for efficient use to investigating complex matters of human-technology relations that often involve messy, intimate, and contested aspects of everyday life. What roles could—or *should*—interactive technology play when we consider it as a long-term, evolving component of everyday life? How do technologies mediate between humans and their actions in the world? How do choices that go into the materials, form, and computation of interactive systems shape human relations to them? And, how do they change over time? Nearly a decade ago, the concept of creating *research products*, as a class of design research artifact, emerged as an effort to support HCI investigations into research questions involving longer-term human-technology entanglements where a research prototype may not be sufficient [1,2,10,13]. Key to the distinction of the research product is that it emphasizes the quality and nature of engagement that people have when they encounter an artifact based on *what it is* (i.e., a research product) as opposed to *what it might become* (i.e., a research prototype). Research products are created to robustly hold up over time and achieve a quality of fit in people's everyday lives through their highly finished, independent, and ongoing

existence. Thus, research products can operate as vehicles for carrying and exploring research questions about people's situated long-term use (and non-use) of new forms of technological objects in everyday life.

Over the past decade, our group has created, deployed, and studied research products that, in varying ways, mobilize conceptual propositions from the slow technology design philosophy and research programme [7,12,15] to investigate how human-data relations that foreground open-ended experiences of personal reflection, interpretation, reminiscence, noticing, curiosity, and exploration might be supported, sustained, and change over time. Across this body of work, we have been interested in the methodological questions involving research products that include:

- How should researchers approach conducting field studies of design artifacts that aim to be in use *some of the time for a long time* – both through direct interaction and while operating in the background of everyday life?
- How should researchers explore participants' potentially changing relations with a research product that they may only occasionally interact with directly?
- What challenges exist in conducting long-term multi-year field studies for both researchers and participants?

This position paper explores these questions through a unique case of one research participant (**P1**) living with *Olo Radio* [11,14] over five and a half year. Olo Radio is a music player that uses a person's listening history archive (via Last.FM [16]) to embody the lifetime of digital music they have experienced with the goal of supporting memory-oriented music listening. Inspired by prior research [6,7,9], key slow technology design qualities shaping Olo Radio's design include it: *takes time to understand*; *manifests change through time*; and, *leverages different forms of time to prompt reflection by amplifying their presence in everyday life*. This long-term study provided the opportunity for us to deeply understand how a research product can become entangled in a person's life over considerable time, through life stage transitions and across changes in domestic location and social organization of the home. It also came with unexpected life changes for the researcher and the participant. The core contribution of this work is to offer an account of a long-term field study of a research product to: (i) communicate what we found over the course of more than five years, (ii) detail unexpected challenges in conducting this study, and (iii) reflect on opportunities and open questions that surfaced through this work. Next, we offer a brief background on the Olo Radio project and summarize key experiential touchpoints over the 5+ years P1 lived with their Olo Radio; and then conclude with open questions about research products and time that we hope to discuss at the workshop itself.

2 PROJECT BACKGROUND & SUMMARIZING MORE THAN FIVE YEARS OF LIVING WITH OLO RADIO

Olo Radio explores different temporal modalities by using the temporal metadata associated with each instance in which a song was previously played to enable the user to interact with music from their past through both chronological (*Life*) and non-chronological timeframe modes (*Day, Year*).¹ Different modes can be selected and toggled by the knob next to the motorized linear slider. The specific position of the slider is encoded to a specific 'point in time' in the user's past that is relative to the timeframe mode. When Olo Radio is turned on, it begins playing the song queried from the slider's current position. If left untouched Olo Radio will continuously play music, slowly moving forward in the timeframe mode. If the slider is moved, the current song will fade out and the song at the new location 'in time' it arrives at will fade in. If the timeframe mode is changed while a song is playing, it will continue to play as the actuated slider moves to the position in time where that instance is located in the new mode. In effect, the playing song remains unchanged, but the sequence of all listening instances surrounding it have been reorganized based on the newly selected mode.

¹ For more details on the design of Olo Radio [11,12,14] also see: <https://www.homewarelab.com/projects/olo-radio>

Originally, we designed and deployed five Olo radio research products with five respective participants for 8 months [14], from May 2019 – February 2020. During this period, the research team (composed of the first author and small team of graduate students) collected descriptive accounts of participants’ lived experiences with Olo Radio through bi-weekly interviews during home visits. Following the conclusion of this study in February 2020, P1 asked to continue living with their Olo Radio indefinitely. We designed Olo Radio with great care and attention to hold up over time; thus, we decided to oblige P1 by agreeing to continue to support its functionality (and underlying Spotify subscription needed for it to run). P1 created their Last.FM account in 2006 when they were a teenager and consistently maintained it, still to this day. Thus, it captured a unique historical record of their digital music listening that spans nearly two decades. At the beginning of the study in 2019, P1 had 181,646 unique listening history instances in their Last.FM archive; by the end of the study in late December 2024, their archive had grown to 249,857 unique instances. Across this period, P1’s Olo Radio continually updated and evolved with P1 as they listened to music in their daily life (outside of using Olo Radio to re-experience their past listening history). Given the mutual familiarity with P1 and the research team, we decided to conduct bi-monthly interviews to continue to discuss their continued experiences with Olo Radio. At the beginning of our study, P1 was a single, part-time restaurant waiter and college student; by the conclusion, they were a married full-time, full-stack software developer. Next, we offer brief annual summaries of notable events the unfolded across the more than five year period of the Olo Radio field study for both P1 and the first author (FA).



Figure 1. Left: Olo Radio at P1’s original shared home living location (May 2019). Right: Olo Radio at P1’s apartment living room (December 2024).

Year 1: May 2019 – April 2020 | Settling into Everyday Life: During this period, P1 lived in a shared house with several roommates. Their Olo Radio was initially positioned in their living room space and hooked up to a centrally featured audio system. This period was characterized by inquisitive use to develop a sensibility for understanding how and when to listen to Olo Radio and the role that could play in P1’s life. Olo Radio emerged as highly valued, with P1 favoring the timeline (*Life*) mode and the time of day (*Time*) modes most often, at times having listening sessions that last more than an hour as they stumbled upon less considered or forgotten music from their past. For FA and team, the onset of the global pandemic in March 2020 disrupted nearly all research activities for the months that followed.

Year 2: May 2020 – April 2021 | New perspectives on Human-Data Relations: P1 experienced continued attachment to Olo Radio, while experiencing concerns around self-disclosure. P1 reported an evolution in the perceived value of Olo Radio as they increasingly recognized unique historical patterns, forgotten memories and associations from deep in their past, and notable shifts in taste recorded in their archive. These experiences were tempered by a recognition that their data, expressed through Olo Radio, was increasingly seen as highly personal, making the living room a less ideal location to house the intimate nature of their archive where it could be listened to (and remarked on!) by other housemates and guests. P1 moved Olo Radio to their bedroom in the shared house and arranged it among domestic objects on a nearby shelf (i.e., among photos and mementos). FA, at times, struggled to stay in consistent contact with P1 due to themselves moving homes, getting married, adjusting to the arrival and chaotic reality of seven puppies in their small dwelling, and grappling with shifting university and societal constraints around the Covid-19 pandemic during lockdown. Two members of the research team completed their studies and moved away.

Year 3: May 2021 – April 2022 | Moving Home: P1's occasional, ongoing interactions with Olo Radio continued this year; however, there was a period of non-use. After years of living in a shared house with roommates, P1 moved into an apartment with their partner (whom they met the year before). This change presented a quandary for P1 – where to locate their Olo Radio? They had only occasionally and sparingly exposed their partner to Olo Radio while they were dating, yet they decided to install it in the living room. Olo Radio took on a prominent position in their living room, now situated to shared objects, photos, and mementos bound to both of their lives. For FA, this was a pivotal moment – would Olo Radio re-emerge as a functional, aesthetic, and integrated artifact in P1's new home and household? Such (re)acceptance would be key to supporting slow technology's aspirational vision of creating "*technology that surrounds of and is part of our activities over long periods of time*" [7:161] and to inquire into "*what it means to design a relationship with a computational thing that will last and develop over time*" [9:11]. Despite years of experience in conducting field studies of slow technologies, for FA there had never been an opportunity to see how a study participant might re-setup a research product themselves in a new home environment. This was likely due a combined set of constraints tied to funding, graduation timelines, the requirement steady and continuous publication in academia, and perhaps even a fear that such change might compromise the study with a participant potentially dropping out. What we found was P1 re-setup Olo Radio entirely on their own as an integrated part of making a new home, and eventually resumed their listening practices, which were increasingly shared with their partner. P1 especially remarked on how this period was characterized by a resurgence of noticing musical tastes that were only barely present in the years prior, which now took on a more prominent presence in their archive (most notably that artist King Gizzard and Lizard Wizard). FA reestablished more consistent bi-monthly contact with P1 during this year time, while preparing for the impending arrival of new child. All funding for the project has concluded. FA connects P1's Olo Radio to their personal Spotify Family account to ensure its continued functionality.

Year 4: May 2022 – April 2023 | Moving Home Again: Year four involved several momentous events. P1 and their partner were married, P1 graduated and began professional life as a software developer, and P1 moved again, this time to a high-rise apartment where the newlyweds updated their domestic aesthetic with new furnishings. This provided a second opportunity to consider understand how P1's relations to Olo Radio may have changed as their life stage evolved. Would Olo Radio be perceived more as a relic of their pre-professional, pre-marital past? Or, might it live on in their domestic lives, offering an anchor drifting back to P1's teenage years, while continuing to evolve along new music and experiences accumulated in their lived present? Again, we found the newlyweds decided to install and setup Olo Radio

is centrally featured in their living room, now alongside wedding photos and honeymoon mementos. P1 also again setup Olo Radio entirely on their own and resumed their practice of exploring and listening to Olo Radio a few times weekly, at times in concerted intentional sessions, as well as more informally as background ambiance. During an interview this year, P1 expressed the self-recognition that Olo Radio had accompanied them across a number of changes in their life, which was also reflected in the historical changes and memories bound up in the music listening archive expressed through it. For FA, this period nearly entirely marked by adjusting to life with a new child and the opportunity to take parental leave for full-time childcare. FA was only occasionally able to connect with P1 – three times during this annual period. All original members of the Olo Radio team have graduated. P1’s Olo Radio remarkably continues to operate without interruption.

Year 5: May 2023 – April 2024 | An New Practice Emerges: Year 5 consisted of P1’s continued use of Olo Radio with their practice having stabilized into a common routine – a few times a week listening with Olo Radio on in the background, while directly interacting and exploring their archive across different temporal dimensions when a particular emotion, association, memory, or song of unrecognizable origin emerged. In our discussions this year, P1 reflected on the perceived value in their digital music listening history, and the value in ‘seeing’ its growth and change over time, often remarking on how different the persistence and ‘aging’ of his personal data kept in Olo Radio seemed from the more fleeting, ephemeral data kept on his changing generations of laptops. P1 also acquired a turntable which was situated in their living room near Olo Radio. As P1 acquired and listened to records this year, they increasingly felt the urge to capture their analog listening history in a digital form. When asked why, they responded with the reflection that, over time, Olo Radio has shown to be much more than merely a music player – it had taken on a key place in P1’s life as historical record that keeps moving into the future alongside them. Their listening history record had become about something more than simply music. P1 desired to have a way of similarly generating a history of their situated listening practices with vinyl records.



Figure 2. The ‘vinyl scrobber’ handcrafted by P1 composed of mahogany wood, a Raspberry Pi mini computer and display paired with a mobile application for logging vinyl listening histories manually.

Year 6: April 2024 – December 2024 | Making one’s own digital history: Halfway through Year 6 marked the conclusion of the study, when P1 contacted FA to inform them of an impending move to an East Asian country. While it was made clear P1 could retain their Olo Radio, they expressed worry and ambivalence over maintaining it from another part of the world where time zone differences, digital music licensing, and firewall disruptions (among other things) may introduce very real challenges for Olo Radio to continue functioning. They desired to give it back so that it could be maintained and live on in FA’s lab and potentially be used by others. During the final interview with P1 in December 2024, P1 showed an invention of their own – a small handcrafted wooden box whose sole purpose was to create an ongoing archive of the vinyl music listening history. P1 had integrated a display driven by a Raspberry Pi internally housed in the box, and designed a mobile application that enables them to manually input each vinyl album they listen to, which is automatically tagged with a timestamp and paired with album art (on the wooden box display) when available. For FA, this was a surprising outcome where a research study participant, over time, created their own novel design based on an emergent recognized need developed, in part, through sum of experiences with a research product over more than half a decade.

3 DISCUSSION & OPEN QUESTIONS

We found that our goal of creating an artifact that exists in the foreground and background of everyday life, which takes time to understand, and which scales and evolves over time benefitted from a long-term study. Olo Radio’s sustained use over time across P1’s three different domestic settings and changes in personal and professional life stages indicate that a strong attachment with requisite meaning and value was sustained. Olo Radio endured both periods of non-use and periods of little contact from the FA, only to re-emerge continually as a central focal piece of P1’s everyday home life, far beyond the originally intended duration for the study. Yet, this came with clear challenges. Funding expired well before this long-term study could be completed, eventually requiring FA to rely on their own Spotify account. Life events caused lapses in communication across the long duration. In what began as a field study of five research products with five participants and a team of five invested graduate students (along with FA), concluded with a single research participant and a single primary investigator.

How could or should such challenges be mitigated in the design and study of future research products? Should long-term contingency planning go into the design of studies that might scale multiple years beyond the initial intended deployment timeline? Another option could be to create less polished and complete research products and rather go the route of DIY kits (e.g., [4]) which would enable potential participants to customize their own devices with no requirement to ‘return’ them to the research team (and no requirement from the research team to offer continued support). While a multiplicity of approaches are needed, this strategy may reduce the capacity to form close, intimate bonds with research participants that, as we found, led to nuanced long-term insights into how a research product can be lived with and (re)domesticated over time.

Another open question centers on: what are the benefits and limits of a sample of one in a long-term, multi-year study? HCI has a growing interest the richness and intimacy that can come from first-person or small scale accounts of long-term experiences with technology [3,5,8]. Our work with P1 provided unprecedented depth into their life experiences, evolving domestic social organization, and the ways in which Olo Radio was used (and not used) in the long-term. Clearly these insights are limited to a single person, in a particular geo-political location in the world, and with a pre-existing interest in listening to digital music and tracking these experiences. Yet, over the years, a unique and unexpected one-to-one research partnership emerged between FA and P1. What began as a study involving two strangers, morphed into an acquaintanceship, and now into a familiar relationship after more than five years. FA had

their own Olo Radio and, as the years progressed, they wondered about shifting the nature of the researcher/participant relationship, and if the project could have taken a more duobiographical turn where the FA and P1's experiences and understandings through their use of Olo Radio over many years could be put in dialogue. This would mean undermining traditional researcher/participant dynamics and boundaries that are common in HCI field deployment studies. While we did not go this route in the Olo Radio project, it signals an area of consideration for long-term studies of research products where, over time, rapport, connection, and familiarity – both with the design artifact as well as people involved in the study – may open alternative, less traditional possibilities for dialogue and documenting rich, situated experiences.

Finally, how should long-term studies of research products be concluded and what happens when participants are left to their own devices? We saw the evolution of P1 from a part-time waiter to full-stack software developer over more than five years. Ultimately, their experience with Olo Radio led them to invent their own personal data history device which presented a surprising outcome. This unanticipated practice in some ways points to the significant role Olo Radio played in their life by which shaping their own desire to further capture, safeguard, and have deeper control over their own listening history data. This is an outlier and it seems uncommon for participants to develop their own versions of the things we produce nor to generatively produce their own unique inventions that they can maintain, use, and tinker with over time. Yet, it does raise the question of what we should leave behind for participants and when or how studies end. From the beginning, with a longer-term project should we build in contingency plans for what can persist after the study finally concludes? Should this be discussed with participants in at different touchpoints across the trajectory of multi-year studies to co-develop a vision together?

Despite the richness, depth, and unexpected long-term duration of the field deployment study of Olo Radio with a P1, it seems we are left with more questions than answers about research products and time, and what comes after – precisely what we hope to discuss and reflect on more in the workshop itself.

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