Exploring the Future of Remote User Research

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Abstract

The rapid move to remote work due to COVID-19 social distancing policies has slowed or stopped most in-person qualitative user research activities. The limitation on in-person activities has pushed many user researchers to consider how they can continue their research remotely and presents an opportunity for user research teams to (re)design their research processes for remote work. In this position statement, I outline prior work in remote qualitative user research methods and discuss how this work can help us to (re)design new tools, methods, and frameworks that can enable remote work. I then propose a set of research questions that can further our knowledge and abilities to conduct effective remote user research. With creative development, we can create remote research methods that afford new ways of understanding user experience today and build more environmentally conscious and accessible research practices for a future where remote research is much more common.

1 Introduction

The COVID-19 pandemic and subsequent social distancing practices have pushed information and technology workers to remote work practices. These workers include user researchers who often conduct in-person lab-based or field-based research talking with and observing potential users to generate a holistic understanding of these user's everyday experiences and inform the development of new product and service designs (Beyer and Holtzblatt, 1997; Kuniavsky, 2003; Laurel, 2003). Due to COVID-19, these in-person research activities have been significantly reduced or even stopped. But with the rapid move to remote work, we may ask ourselves how important is it that this work is done in-person? Over the years, researchers and practitioners have explored how to conduct user research remotely without needing to be physically co-located with users. Today, many user researchers who work on desktop, web, and mobile software products can readily do their work using a slew of tools and technologies such as high-quality video chat, screen sharing, and remote data telemetry (Black and Abrams, 2017). However, the same cannot be said of user researchers who work on products and services that fundamentally require understanding users in physical contexts such as the home, the workplace, the car, or on the go. For these user researchers, social distancing has reduced their ability to conduct effective user research.

The challenges imposed by social distancing offer an opportunity to rethink how contextually situated user research is done. I believe that there is a need to explore new directions in remote user research where researchers can conduct their work from anywhere with an internet connection. These new research directions will build on prior work to develop new tools, methods, and frameworks that allow user researchers to conduct contextually situated work without needing to be on location. This research will build knowledge about the strengths, limitations, and strategies for conducting effective remote user research that maintains the validity of research results and supports the development of new human-centered products and services. Finally, this research provides an opportunity for us to explore how the user research profession can be more sustainable and accessible.

In this position statement, I outline prior work in remote qualitative user research methods and discuss how this work can help design teams rethink their practices today under social distancing. I then propose a set of research questions that can further our knowledge and abilities to conduct remote user research. These research questions include explorations of new systems that allow for better contextual understanding, studies on the effectiveness and limitations of remote methods, and research into how remote user research methods can be (re)designed to be more accessible and sustainable. With new technology products increasingly

augmenting our daily lives, good user research will be more important than ever. However, doing great user research may not always mean we must be co-located with our users.

2   Relevant Body of Work

User research is research done to understand people's experiences, goals, and needs to inform the design of products and services (Kuniavsky, 2003; Schumacher, 2009). To conduct their work, user researchers employ a variety of qualitative and quantitative research methods ranging from early-stage needfinding (Patnaik and Becker, 1999), focused observation and feedback sessions (Beyer and Holtzblatt, 1997), lab-based usability studies (Nielsen, 1994), and statistical analyses of behavioral data (Sauro and Lewis, 2016). While a rigorous user research process employs qualitative and quantitative methods, many practicing user researchers specialize in one or the other. This position statement focuses primarily on the work that *qualitative* user researchers do as it is more often done directly with users in-context rather than through analyses of user data and behavioral logs. This focus on in-context work means that qualitative research methods are more likely to be impacted by social distancing and remote research operations due to it being harder to be travel to and be co-located with users.

2.1   User Research Methods for Contextual Understanding

Much of qualitative user research in product and service design is inspired by ethnographic field methods that focus on capturing a holistic and descriptive view of people's lives in their natural settings (Blomberg et al., 1993). Ethnography often takes the form of longitudinal, field-based observations and interactions with people to understand their everyday experiences and their point-of-view (Dourish, 2006). Within professional design teams, similar goals are met through ethnography-inspired qualitative field-studies in the form of "rapid ethnography," with field-based work often lasting a few days (Millen, 2000; Plowman, 2003) rather than the more extended deployments of academic ethnography. These rapid qualitative methods have become core research activities for professional design teams (Laurel, 2003; Kuniavsky, 2003; Kelley, 2007; Sas et al., 2014) as they allow a team to quickly understand the relationship that people have with products and services in the larger context of their lives (Beyer and Holtzblatt, 1997; Dourish, 2004) and help the team develop empathy for their users, a core tenant of modern design thinking (Patnaik and Becker, 1999; Kelley, 2007). Furthermore, field-based qualitative studies allow teams to understand the use of new products outside of the lab, helping them find social and contextual issues and interactions that are nigh impossible to see without being in the complexities of the real-world (Carter et al., 2008; Hornecker and Nicol, 2012).

At their most basic level, most qualitative user research methods champion going out to the field to observe and interact with people directly. These activities include interactions with people in their community and increasingly means traveling internationally to engage with users on the ground. However, with almost all travel stopped and with social distancing measures limiting even local interactions, qualitative user researchers are forced to either halt their research operations or adapt them to remote work practices. As computing-enabled products and internet connectivity have increased, researchers have developed remote research tools that enable design teams to conduct qualitative user research without needing to be co-located with the user.

2.2   Remote qualitative user research methods

To overcome the challenges of being in the field with users, researchers and practitioners have developed remote user research methods and systems to capture qualitative experience data (Black and Abrams, 2017). These methods can be asynchronous, where users capture their experience without interacting with the researcher at the same time, or synchronous, where researchers interact with users in real-time to understand

their experience. In the following sections, I describe some of the more commonly used remote qualitative user research methods.

2.2.1 Experience sampling

One of the earliest forms of conducting asynchronous remote qualitative research to understand people's everyday experiences is the experience sampling method, developed by Larson and Csikszentmihalyi (1983), where research participants are periodically asked to document and answer questions on their experience when pinged by a personal communication device. Experience sampling was further developed by Consolvo and Walker (2003) for use on mobile phones. By using people's mobile device, researchers can capture text-based descriptions of people's experience in the moment. With the proliferation of mobile phones and open source software, experience sampling has become nearly free to implement with a wide range of users. However, text-only interaction limit the view of the places and spaces that a remote researcher can experience and requires participants to describe their experience in more detail to remote researchers. *MyExperience* by Froehlich et al. (2007) and *Momento* by Carter et al. (2007) expand upon these methods and the added capabilities of mobile device with cameras, sensors, and higher speed data to allow users to capture images, video, and data logs of their experiences. Today, there are a number of commercial and open source apps that researchers can use to conduct experience sampling such as Experience Sampler, LifeData, and mEMA. Experience sampling has the benefit of capturing user experience in the moment without the researcher needed to facilitate the interaction. However, even with the added benefit of video and sensor logging, experience sampling can be limited by missing critical events due to random sampling, users being preoccupied in another task, and the researcher not being able to follow-up on questions that they may ask given the answers that are received.

2.2.2 Remote contextual inquiry and usability studies

Remote contextual inquiry (English and Rampoldi-Hnilo, 2004) and usability studies can supplement the limitations of experience sampling by having the researcher interact synchronously with a user, allowing them to observe a user's experience and interview people in real-time. Within software product development, researchers have explored how remote screen sharing and video conferencing could be used to develop desktop applications (Hartson et al., 1996; English and Rampoldi-Hnilo, 2004) and mobile websites (Waterson et al., 2002; Burzacca and Paternò, 2013). User researchers can observe and interact with people around the world (Dray and Siegel, 2004), helping them reach a broader cross-section of their users and allowing the research team to interact with users without needing to travel. Today, the user of videoconferencing, screen sharing, and data logging for desktop, web, and mobile software applications if common practice and supported by many purpose-built user research tools such as User Testing, UserZoom, and Lookback.

2.2.3 Effectiveness of remote user research

There is, of course, the question of whether remote methods are as effective as in-person methods. When testing the usability of software, prior research has shown that *synchronous* remote methods, including talk-aloud protocols and screen sharing, can be as effective as in-person studies in finding usability issues (Brush et al., 2004; Andreasen et al., 2007; Chalil Madathil and Greenstein, 2011). Brush et al. (2004) also report that most participants in their comparative study preferred the remote study over the local study. Participants felt little difference in their ability to complete the study, suggesting that remote studies can provide a better experience while also allowing the researcher to gain more access to the user's real-world environment. Participating remotely can also be better for users who might otherwise not be able to come to a research team's location (Andreasen et al., 2007).

Despite these benefits, conducting remote studies can be more work for researchers and participants and can find fewer usability issues (Andreasen et al., 2007; Bruun et al., 2009). Furthermore, many of these previous studies primarily focus on quantitative aspects of usability rather than qualitative factors (Sauer et al., 2019), making these methods potentially less fruitful for early-stage formative research and for understanding more complex aspects of user experience of user's lives. For example, while conducting remote studies with disabled participants, Petrie et al. (2006) found that remote methods were less effective at providing rich qualitative data than in-person methods due to limitations in seeing the complexity of the user's real-world contexts.

2.3   Remote Qualitative Research in Complex Environments

To overcome the limitations of remote research, prior work has explored how to allow for rich qualitative user experience research in complex environments outside of desktop or mobile screen interfaces.

2.3.1   Wizard-of-Oz in the wild

Ubiquitous computing and augmented reality researchers have made use of Wizard-of-Oz methods (Dahlbäck et al., 1993) in real-world environments, such as work on audio-based spatial narratives for visitors to a local cemetery (Dow et al., 2005). While this early work was done with a researcher following out-of-sight of the user, it laid the groundwork for remote Wizard-of-Oz research conducted from anywhere with a network connection.

The availability of high-speed cellular networks and ever-improving computing, sensing, and video capabilities of devices in our physical world now allow researchers to conduct remote research with multiple video, audio, and data streams from a user's environment. My work has looked at developing these kinds of multi-modal systems to enable remote user researchers to conduct contextual inquiry and interaction prototyping in complex real-world environments. My collaborators and I have developed and used a remote user research system, called WoZ Way, to understand the user experience of cars with advanced driving assistance features (Martelaro and Ju, 2017) and to explore music listening experience in the car and the home (Martelaro et al., 2020). WoZ Way allowed us to conduct rich qualitative research with users in their own environments and allowed our team to collaboratively conduct design research while being physically distributed in three different locations.

2.3.2   Chatbot assisted user research

Recent work on qualitative remote research is also exploring new ways of conversing with users. Our work exploring music experience had interaction researchers using a remote-controlled speech agent, DJ Bot, to ask the user questions during their research sessions (Martelaro et al., 2020). This work follows a trend in emerging remote user research methods where chatbots are used to conduct remote qualitative fieldwork. Using chatbots and speech agents builds upon experience sampling by allowing for a more conversational and dynamic question asking experience. For example, Broadman and Koo (2016) of IDEO used remote-controlled mobile phone-based chatbots to explore different services for health and wellness, having the remote team dynamically try new conversations to help determine user's needs. Tallyn et al. used a simple automated mobile phone-based chatbot to explore people's experiences at a festival, using their location to initiate questions (Tallyn et al., 2018).

There are still open questions as to how effective chatbot based qualitative methods are. In the case of Ethnobot, while users interacted with the bot for an average of 120 minutes during the festival. Many users were frustrated with the bot's rigid question asking and inability to build on the things that the users talked about in their responses (Tallyn et al., 2018). Despite the reports of these challenges, other work has shown

chatbots to be effective at capturing more conversational and realistic information from users. In studies of chatbot-based surveys, Kim et al. (2019) found that they collected higher-quality data using chatbots with a casual conversational style. Xiao et al. (2020) recently showed similar results in a comparative study of an AI-powered chatbot vs. a typical web-based survey of open-ended questions, finding that users were more engaged and produced higher quality responses with the chatbot. Although it is still early in our understanding of how well machines can hold qualitative conversations with users, these initial results suggest that "a chatbot could perform part of a human interviewer's role by applying effective communication strategies." (Kim et al., 2019, pg. 1).

2.3.3 Things as co-ethnographers

With software and hardware products gaining more sensors and increasing levels of AI, researchers are also redefining the role things have during qualitative user research. Giaccardi et al. (2016) explore the idea of "things as co-ethnographers" where products imbued with sensors and cameras collect information in people's everyday environments such as the home. Using things as co-ethnographers, research on everyday life is viewed from the perspective of augmented products. It gives the remote research team longitudinal access to user experience and provides "unique insights about the relationships between objects and human practices" (Giaccardi et al., 2016, pg. 245). Gorkovenko et al. (2019) extend the use of thing co-ethnographers to provide remote user researchers with real-time data. Their team used a speaker embedded with motion sensors to stream data to a research dashboard, allowing the research team to view the current music and any interaction of multiple users who had the device. The remote researchers then used data from the speaker to facilitate remote contextual inquiry through instant messaging, allowing users to respond to the researcher's questions through text, photo, or video. My work also builds on the idea of smart devices assuming a co-ethnographer role by having the things ask the questions. In this mode, needfinding conversations are remotely mediated through the products themselves instead of the products merely monitoring users or remote researchers only chatting with users through another communication channel such as video chat (Martelaro and Ju, 2019).

Overall, these trends in conducting remote user research with smart devices, remote data capture, and real-time communication are forming what Murray-Rust et al. call "entangled ethnography" (Murray-Rust et al., 2019). This vision of entangled ethnography looks to develop research practices "where constellations of people, artefacts, algorithms and data come together collectively to make sense of the relations between people and objects." (Murray-Rust et al., 2019, pg. 1). The use of things as co-ethnographers and an entangled ethnography framework may help remote user researchers design research practices that better use the devices in people's environments and allow for them to conduct richer qualitative research remotely.

3 Current Implications

The COVID-19 pandemic and subsequent social distancing restrictions have significantly impacted qualitative user researcher's ability to do in-person fieldwork. Research teams are not going into people's homes, riding along with people in their cars, or getting on-location in different cities or countries. In my conversations with user researchers after social distancing policies were enacted, research teams were quickly reworking their plans to enable remote work. Some teams, especially those who work on software, already have remote research operations using video conferencing and screen sharing in place and are further leveraging these capabilities. However, other research teams who work with hardware or in environments such as the car are limiting their work to remote interviews and surveys or are suspending research operations temporarily.

We recently conducted an online survey collecting 56 user research professionals (primarily from the US) responses to question on the transition to remote work and are now looking at preliminary results.

When asked "On a scale of 1 to 5 (1 = not impacted at all; 5 = extremely impacted), how has your research process been impacted by COVID-19?" 23 researchers responded their work was *heavily impacted* (15 responses of (4) and 8 responses of (5)), 28 researchers responded their work was *somewhat impacted* (14 responded of (2) and 14 responses of (3)) and only 2 researchers said their work was *not impacted at all*. Respondents discussed canceling plans to travel to different countries, having difficulty recruiting participants, conducting ineffective remote contextual inquiry sessions over video chat, and finding it hard to collaborate and share qualitative findings with their other team members. While the current situation is

Figure 1: Survey responses on how severely COVID-19 has impacted user researchers work practices.

clearly a challenge for many teams, less impacted researchers often reported that they were already using remote research tools such as UserZoom and UserTesting. Those who did not have these tools in place now are learning about and working to implement remote research tools. Our survey found that 5 people were "learning new tools and activities for remote research" right *before* social distancing policies were put in place while 25 researchers were learning new tools right *after* social distancing policies were put in place.

Today, many teams are implementing more well-formed methods such as remote contextual inquiry on the desktops and experience sampling through mobile devices. However, many researchers still find that these methods lack the qualitative richness that they would prefer when doing their work. While user research teams are still in the early stages of figuring out their new normal, some that I spoke with have suggested that this is an opportunity for the user research profession to reconsider and (re)design their research practices for a world that may increasingly require and desire remote interaction with users. As research teams continue to work remotely, we may see more examples of emerging methods in professional work. Of course, rethinking our research process for remote work raises many questions for the field: Does qualitative work need to be done in person? Do we need to move so fast while conducting our research? How do we collect rich qualitative experiences and understanding when we can not be in the field? How do we ensure we are collecting valid data about real user experiences? Many of these questions will need to be answered to see a more emerging framework for user research to take hold in industry. The present situation may accelerate the testing and acceptance of remote observation in complex environments and the increased use of things as co-ethnographer

The current moment and the coming changes to remote user research processes also allow us an opportunity to think about the desired future of the profession in regards to two other important considerations that will likely be influenced by the move to remote work: environmental impact and accessibility. By moving research operations to remote practices, we can allow design teams to conduct work with global user groups without requiring extended international travel. Reducing travel has the potential to reduce carbon emissions and can be a first step in helping teams to create sustainable design processes. Furthermore, by enabling more remote work, we can also make the user research profession open to more people who may have otherwise found fieldwork challenging. During the COVID-19 pandemic, many jobs that may have been considered too hard to be done remotely, and thus hard for those who are disabled, have now made many accommodations for remote work (Ishisaka, 2020). We can take this opportunity to design new remote research practices that are more inclusive for user researchers with different abilities. For example, researchers who use wheelchairs may have found it hard to travel to user's locations or access user's environments before but could now conduct remote contextual inquiry from their own locations. Alternatively, researchers who may have trouble communicating directly with people due to limited sensory
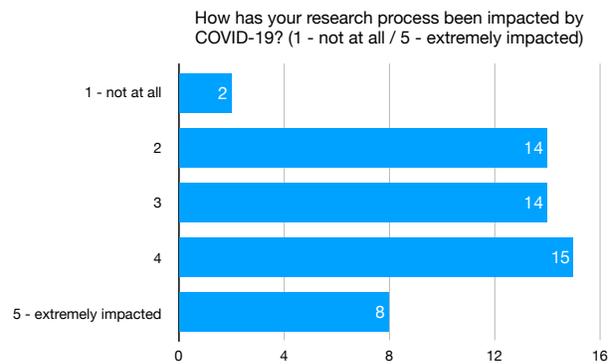
abilities could use smart devices, digital sensors, and chatbots to help them better engage with their users.

3.1 Call for research and development

I believe that the current moment is an opportunity to research and develop new tools, methods, and frameworks for doing remote user research. The literature on ethnographic and user research methods (Blomberg et al., 1993) offers a guide for field-based qualitative work as being:

1. **Descriptive:** Researchers can see and record user behavior and attitudes

2. **Holistic:** Researchers can understand user behaviors and attitudes in relation to the larger context and systems in the user's life

3. **Done in the user's natural environment:** Researchers are embedded in the user's natural environment so that they can experience the user's life more closely to the user's perspective

While being co-located with users is the most straightforward way to achieve these goals, it is not a strict requirement. Instead, these principles can guide us in future development and studies of remote user research.

The various remote user research methods described earlier attempt to provide researchers with the ability to conduct descriptive, holistic work done in the user's environment even if they cannot be there in person. While video conferencing and screen sharing are a start, some of the researchers I have spoken with and who responded to our survey found these environments to be too limiting. They expressed a desire to be able to see more of the user's context. To enable more holistic user research, we will need to disconnect from desktop and mobile interfaces and capture a broader picture of our users' environments. New tools should allow us to follow users where they want to be rather than limiting their interactions with the remote research team to their computer or phone. The prior work on experience sampling, remote contextual inquiry, and remote wizard-of-oz methods suggests ways to capture and understand a user's context when we augment user's environments with photo, video, audio, and data capture capabilities.

Going further, emerging ways of conducting user research through AI-enabled chatbots and smart devices can further allow remote research to be done in more complex environments. By incorporating things as co-ethnographers, research teams may be able to access more complex environments, conduct research over longer deployments, and interact during more convenient and important times for their users. Early work suggests that these methods may even support better qualitative data capture and description than when researchers are in-person or conducting survey-based research.

There are several open questions that should be addressed as we (re)design our user research process to enable better remote work. Below, I list what I believe are some initial guiding questions for research and development in the space of future remote user research.

- **What information do in-person researchers attend to and get the most value from? How can we capture and transmit this information in remote settings?** (Petrie et al., 2006) User researchers often rely on non-verbal cues, broadly observing the user's context, and experiencing the physical sensations of a user's environment to develop a full sense of user experience. By understanding what researchers attend to and value, we can consider ways to design remote tools that provide these experiences directly or through proxies. Also, by collaboratively building new methods with professionals, we can leverage their intuitive sense of what is important and valuable to add these capabilities to remote research tools.

- **How effective are different forms of emerging remote user research methods in capturing valid data compared to in-person methods?** As the ecosystem of remote user research methods grows, choosing appropriate methods will require a user research team to understand what kinds of data they

can collect and how valid their findings are given a particular context and research method. Currently, there are few comparative studies or measures of the effectiveness of different qualitative methods in practice. This is especially true for emerging methods such as using AI-based chatbots and conversational smart devices as co-ethnographers in complex open-world environments. While prior work has shown the opportunities of these new methods, more studies on their effectiveness and limitations will help professionals incorporate them into their user research activities.

- **What opportunities do remote methods afford that are improvements over in-person methods?** The prior work developing new remote user research methods have shown some capacities that are often not possible using in-person methods, such as capturing aspects of user's lives during all hours of the day (Giaccardi et al., 2016), collaboratively working with distributed research teams (Martelaro et al., 2020), and reducing the observer bias on participants (Brush et al., 2004). As more researchers move to remote methods, there is an opportunity to document what other benefits there are for teams such as cost, time, access, data richness, and ease for participants.

- **What tools will allow qualitative researchers to build and deploy their own remote research systems?** Remote research methods are all mediated by technology. This means that user researchers must either find and learn how to use tools that fit their intended workflows or build their own tools to meet the needs of their specific user context. There are opportunities for others to develop extensible tools and frameworks for allowing people to build remote research systems, even if the research team has limited technical capabilities.

- **How do different remote user research methods compare in regards to the user's experience while participating in the research?** As we use and develop our remote research practices, we must also take into consideration the user's experience as a participant. In many cases, remote research may be more convenient and less intrusive than in-person studies. However, remote research methods may also be more time-consuming, cumbersome, or intrusive, depending on how they are executed. Studies evaluating new methods should look to capture the user's experience as a participant and provide guidance on picking appropriate methods to use in practice.

- **How can we conduct data-enabled remote research ethically?** (Murray-Rust et al., 2019) Remote user research methods inherently require data capture and transmission. As we use more remote methods, we should also take care to respect user privacy. Future work should explore how we obtain continuous consent from participants and help participants understand what of their data is being collected. Moreover, we should develop methods that foster conversation and interaction with users rather than surveillance and monitoring of users.

- **What are the environmental impacts of our current user research processes and how can we reduce our impact through remote methods?** Although we know that all travel contributes to carbon emissions, few studies document user research's environmental impact. For small teams with infrequent travel, the impact may be low, but larger organizations with global user bases may have a higher impact. Remote research operations have the potential to reduce carbon emissions significantly. Future research should look to estimate the impacts of current in-person research and how much the environmental impacts could reduce with remote research.

- **How should remote user research activities be designed so that they are inclusive and available for user researchers who might otherwise find fieldwork challenging?** As with many other forms of work, much of what we thought needed to be done in person can be accomplished remotely with proper accommodations. Future research should consider exploring who might currently be left out of field-based user research teams. We should then collaboratively redesign remote user research tools

and methods with those of different abilities so that a more diverse set of people can work as user research professionals.

4 Conclusion

The COVID-19 pandemic has presented many challenges to qualitative user research by shutting down many in-person research activities. Although the virus is temporary, this event will most likely change how many organizations conduct their user research and will push them to use and develop remote qualitative research methods. Even when we can return to conducting in-person research, having a robust remote research portfolio can act as insurance against future restrictions. It could also allow for a more cost-effective, environmentally conscious, and inclusive way for organizations to understand their user's experiences. To develop new methods, we can build upon a strong foundation of prior work on experience sampling, remote contextual inquiry, and remote wizard-of-oz methods. We also have an exciting new set of research methods and frameworks employing the increasing amount of computation and smart devices in our world to augment our research teams with new data collection and user interaction techniques. As our current circumstances accelerate the move to remote user research, I look forward to contributing toward and seeing new developments in building better research processes to help designers keep up with our rapidly changing world. With creative development, we can build remote research methods that afford new ways of understanding user experience today and for a future where remote research is much more common.

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