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CODESIGNING TECHNOLOGY FOR A VOLUNTARY-SECTOR ORGANIZATION

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Abstract: *This paper presents an investigation into the experiences and perceptions of volunteers and community managers of an Australian voluntary-sector organization that supports young help-seeking people. The process focused specifically on the design of a chat tool, a rudimentary version of which was conceptualized and tested during a trial completed prior to this study. The process explored the motivations and experiences of these volunteers using a codesign approach, which led to the development of specific features of the chat tool that were tailored to the nature of their work and organization, as well as the sector-specific ethos. We employed several research methods, which included interviews, focus groups, and participatory design workshops. Thematic analyses were performed on the resultant qualitative data. The methods, motivational themes, and the ensuing design solutions that were implemented are discussed in detail with the aim of encouraging codesign of technology for voluntary-sector organizations.*

Keywords: *chat system, codesign, participatory design, volunteers, human–computer interaction.*

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INTRODUCTION

The design of any technology requires a deep understanding of the users and the nature of work of the users (Rogers, Sharp, & Preece, 2011). While the research on technology in private and for-profit sectors has made significant advancements in the last few decades, research on technology in the voluntary sector[1] remains dismal, with a few initiatives undertaken sporadically (McPhail, Costantino, Bruckmann, Barclay, & Clement, 1998; Morse, Cerretani, Halai, Laing, & Perez, 2008; Schümmer & Haake, 2010). A plausible reason for this could be that many routine tasks performed in voluntary-sector organizations are similar to those in for-profit organizations, so naturally, one could assume that technology used in the latter can be successfully adapted for the former. For instance, an integrated customer chat service like Intercom[2] can be used both by a bank employee and by a volunteer working for the Red Cross. Thus, most systems are designed for the for-profit sector and nonprofits generally follow suit (Balser, 2008). Another reason to consider is the lack of capital for investing in organizational technology in the voluntary sector, which makes this sector rely heavily on private donations and grants from the governments in developed nations (Balser, 2008).

Research has shown that the voluntary sector differs from the for-profit sector in terms of work motivation and demographics of its workers (Leete, 2000). It is worth pointing out that this sector uses the service of volunteers abundantly, individuals who are not usually driven by explicit material considerations (Bussell & Forbes, 2002). The importance of customizing technology to the voluntary context and its people has been recognized as the key to the success of these organizations (Balser, 2008). Moreover, technology changes work processes, tasks, job satisfaction, workload, and power relationships in the voluntary sector (Saidel & Cour, 2003). Thus, it is essential to emphasize the importance of creating a bridge between the voluntary sector and human–computer interaction (HCI) research so that the latter better addresses the need for designing technology for this sector.

Establishing requirements for an interactive system requires elicitation of those requirements using suitable methods (Rogers et al., 2011). In the past, the field of software engineering has employed some very rigorous requirements-gathering methods, typically focusing on accuracy and quantitative measurement in software development, which reflects its conventional engineering roots (Preece & Rombach, 1994). The gradual shift of focus to usability and the user in a holistic perspective has resulted in software engineering adopting more flexible and creative approaches toward designing and developing systems (Löwgren, 1995). For instance, the core values of the currently popular agile software development methodology reflect this adaptation, as enshrined in the agile manifesto: (a) individuals and interactions over processes and tools; (b) working software over comprehensive documentation; (c) customer collaboration over contract negotiation; and (d) responding to change over following a plan.[3] This and many other methods and techniques owe much to design approaches such as participatory design (Kautz, 2010) and other sociotechnical perspectives that relate the users to technology within specific contexts (Cooper & Foster, 1971).

Codesign is a creative approach used to inspire the design process (Guerrini, 2011). It focuses on the collaboration among the users, designers, and researchers (Sanders & Stappers, 2008). This approach also is known as participatory design, which has roots in the Scandinavian labor movement that emphasized involving the workers in the design of their work environment (Schuler & Namioka, 1993). The theory behind this approach is that the tacit knowledge of tasks

cannot completely be formalized or quantified but rather needs to follow a flexible process of codesign and coresearch (Spinuzzi, 2005). Depending on the discipline, context, or research or design stage—and numerous other factors—the codesign approach usually involves creative techniques such as interviewing and group discussions, brainstorming, storyboarding, affinity diagraming, mockups, role playing, and storytelling (Sanders, Brandt, & Binder, 2010; Steen, Manschot, & De Koning, 2011). Such activities generate information-rich qualitative data, which, until recently, were underutilized in the social and behavioral aspects of technology research, given the earlier focus on quantifying data in technical fields (Dybå, Prikladnicki, Rönkkö, Seaman, & Sillito, 2011).

Technology designers have applied the codesign approach in devising a wide range of products and services, and its relevance is highly apparent in sectors that are resource scarce and public-service oriented (Pilemalm, 2018). Studies have shown that involving the users in the design process results in the creation of products and services that are significantly more useful and valuable for the users as well as their participating organizations (Kristensson, Gustafsson, & Archer, 2004; Steen et al., 2011). With respect to technology design in a social context, specifically software and information systems, the codesign approach has been successfully used to design for e-governance (Anthopoulos, Siozos, & Tsoukalas, 2007), education (Penuel, Roschelle, & Shechtman, 2007), nonprofits (McPhail et al., 1998), and community engagement (Merkel et al., 2004), among many others. It is within this context of designing software for a voluntary-sector organization offering public service that we place our project.

BACKGROUND

Digital Peer-Support Service for Youth Mental Health

Providing mental health support to young people is challenging due to the stigma and the debilitating nature of mental illness and the common hesitancy to seek help (Gulliver, Griffiths, & Christensen, 2010). Indeed, only 29% of young people (aged 16–34) in Australia with mental health problems reported using any support services, compared to 40% in older age groups (Australian Bureau of Statistics, 2010). Several studies conducted in other countries representing a wide range of healthcare practices consistently show a similar trend (Clement et al., 2015; Gulliver et al., 2010). This makes an online, specifically online chat, service a quite useful, instantaneous, and cost- and time-effective way of delivering appropriate help while simultaneously maintaining the privacy of the help seeker (Dowling & Rickwood, 2013; Reyes-Portillo et al., 2014; Hoermann, McCabe, Milne, & Calvo, 2017). Peer-support technologies for the provision of mental health services take a step back and, instead of dealing with problems after they become aggravated, they deal with early signs of mental distress and, thus, are proactive rather than reactive. Peer support is an important aspect of a holistic solution to youth mental health support (Fo & O'Donnell, 1974; McGorry, 2007). Instead of relying completely on the clinicians and professional therapists, the peer-support model utilizes trained peers who motivate and gently nudge the mentally distressed youth towards the right mental health and well-being choices. These peers are not professional mental health workers but, in most cases, volunteers who take an active interest in the cause that they associate with (Davidson, Chinman, Sells, & Rowe, 2006).

ReachOut

This study focuses specifically on the design of a peer-to-peer chat system for ReachOut, a voluntary-sector organization dedicated to providing mental health and general well-being support to Australians aged 14–25 years. The aims of ReachOut are early intervention, prevention, and information (ReachOut, 2015). Accordingly, the volunteers do not offer online counseling or psychotherapy, but the outcomes of their peer support for the distressed youth are no less important. The service provides either immediate relief to the young person or helps him/her recognize the need for clinical help. Currently, most online peer-to-peer support in Australia occurs via the ReachOut forum, where trained volunteer peers communicate asynchronously online with help-seeking youth and offer empathetic understanding, personal encouragement, and careful, tailored referral to the appropriate resources.

The proposed ReachOut online chat forum was intended to be workable for the users of the system. These users comprise two main categories: visitors—young people going through tough times and seeking help—and moderators, the online volunteers who are trained by ReachOut to offer peer support to distressed youth (Naqshbandi et al., 2016). The moderators are young adults, aged 16–25 Australian residents, who are recruited and trained by ReachOut to moderate its online discussion forum. These moderators are supervised by and report to professional senior community managers within ReachOut, individuals who have specialized qualifications and experience. At the time of the study, ReachOut had 19 moderators dispersed across Australia who, collectively, had moderated more than 35,000 forum posts from approximately 4,000 visitors within the years 2014–2015 (ReachOut, 2015). These moderators have a good understanding of online technology and feel confident enough to use it for their volunteer work. They generally have some vocational or other volunteer experience or tertiary-level educational qualification in mental health, community affairs, social work, or working with young people. The moderators are categorized as junior or senior moderators based on the regularity and length of their moderation activities. In other words, moderators possessing less than a year of regular experience are junior moderators while those with longer service are senior moderators.

Chat Trial

In order to gather some evidence regarding end-user interest in live chat option, a real-time peer-to-peer chat-based support system was introduced at ReachOut for the first time during a trial that was a precursor to this study (Milne, Hoermann, & Calvo, 2016). This trial introduced a simple version of a text-based chat service to the ReachOut Web site and had pre- and postchat surveys for 84 visitors and the ReachOut moderators. Of the 84 visitors, 21 visitors were deemed as trolls and 18 visitors were out of the eligible age bracket during the prechat survey. Of the 45 remaining visitors, only 29 gave their informed consent. Both the visitors and the moderators rated the trial quite positively—26 out of 29 (90%) participating moderators rated the moderator–visitor chat session as worthwhile, while 18 out of the 29 (62%) visitors who finished the postchat survey thought the same. Ten of the 29 participating visitors did not finish the postchat survey, and one visitor did not think it is worthwhile because he wanted help with homework. Of the visitors who completed the survey, the ones that had reported sad or anxious moods at the start reported feeling better after the chat. The helpful text links shared by the moderators in the chat resulted in a good click rate of 73%.

However, analysis showed that a considerable amount of the moderators' time—even on chat conversations with a visitor who moderators deemed worthwhile—was spent idle, waiting for the visitor to respond (56%), looking for relevant resources (13%), assessing eligibility (14%), and so on. This meant that, at any given time, the moderators could have handled more visitors or made better use of their time and efforts through other services. The busiest hour on ReachOut forum in the year 2015 involved almost 800 visitors, indicating that the moderators often engage multiple help seekers simultaneously. Given the limited number of moderators working actively in the forum at any given time, introducing certain automations could potentially help facilitate the chat moderation process. However, it was not clear from this trial what the moderators would consider appropriate and useful, or what system or service would be in line with theirs and the organization's values. Moreover, the researchers recognized the possibility that other solutions for making ReachOut's online peer-to-peer service more efficient and easy might not have been considered because of the limited nature of the trial. While the behavior of visitors to the ReachOut site has been studied extensively (e.g., Burns, Morey, Lagelée, Mackenzie, & Nicholas, 2007; Collin et al., 2011), the behavior of moderators has not attracted much attention. Consequently, further research was needed to examine the moderators' perspectives and explicitly explore these questions.

A few challenges for engaging with the moderators were known prior to the study. For example, they require great flexibility in deciding how much personal time they can spend on moderating. They are geographically dispersed within Australia and within multiple time zones, thus potentially interfering with communication with one another. More importantly, the community managers, who are paid employees of the organization, felt that it was essential to make sure that the moderators were well supported throughout the emotionally demanding task of providing synchronous chat support to vulnerable youth. Additionally, the dynamic between the moderators and their community managers represented an important aspect to be studied. These community managers are responsible for overseeing the moderator recruitment, training, and monitoring, and they serve as the moderators' regular point of contact with the organization and thus, form an essential component for the moderator engagement. The importance of involving community managers for designing volunteer tasks and engagement with an organization is backed by ample evidence in peer-reviewed literature for both traditional and online forms of volunteering (Alfes & Langner, 2017; Eveleigh, Jennett, Blandford, Brohan, & Cox, 2014; Shin & Kleiner, 2003).

Thus, it seemed worthwhile to continue the study in order to propose solutions supported by further research. This research would require a dynamic approach that allowed the researchers to explore redesign of the chat system while considering the multiple social, personal and organizational factors that could impact effectiveness of the system and the engagement of the moderators. Consequently, the research team chose a codesign approach. The goals of the research were (a) understanding moderators' expectations and motivations, (b) determining moderators' current aptitude in using software systems as part of their work, (c) understanding moderators' perceptions of the integration of automation in the chat system, and (d) exploring the dynamic between the moderators and community managers.

METHODOLOGY

This study used a codesign approach that involved the researcher-designers[4] (Authors 1-4, 7), and participants from ReachOut (the community managers, Authors 5 & 6), and the moderators.

The researcher-designers proposed activities with the intention of involving all these parties during the design process. In their planning, the researcher-designers understood the importance of choosing methods that would be most effective toward achieving our shared research goals. This study comprised three stages: an initial workshop with some participatory activities, interviews with individual participants, and a final follow-up workshop with participatory activities. All the interview and workshop sessions were audio recorded for subsequent analyses. For coding practices, we used the general inductive approach (Thomas, 2006).

We carried out this study in accord with the recommendations of University of Sydney ethics conventions. The protocol was approved by the University of Sydney Ethics Committee (Project No. 2016/06). All subjects signed written informed consent agreements in accord with the National Statement on Ethical Conduct in Human Research (2007).

Study Design

To facilitate design considerations, each workshop involved a general focus group discussion around the motivations, goals, and experiences of the moderators, followed by several individual and group activities designed to gather specific system-design requirements. The first workshop session introduced the concept of a peer-to-peer chat system by demonstrating a series of low-fidelity prototypes in order to elicit responses and critiques from the moderators. The subsequent online individual interviews complemented the information gained from the first workshop session. Finally, in the second workshop session, we demonstrated a functional chat system to confirm that the design elements were in line with the needs of the moderators and context of the chats. We conducted several chat simulations in which moderators, community managers, and researcher-designers role-played the moderator–visitor chat sessions, based on the visitor personas extracted from the ReachOut forum, in order to test the proposed concept (Workshop 1) and system (Workshop 2).

The workshops were conducted within the ReachOut headquarters. This location is the usual work facility of the ReachOut community managers. The moderators joined remotely from different parts of the country via Skype. The participant information sheet, consent sheet, workshop materials and artifacts with remote participants were exchanged via email.

Participants

Our collaborators within ReachOut Australia recruited a representative sample of volunteer moderators; all recruited moderators and community managers agreed to voluntary participation. The participating community managers had several years of experience dealing with the moderators in ReachOut. The moderators who participated in the workshops had been actively moderating the online forum for at least a year and were therefore senior moderators. The moderators who participated in the interviews (Stage 2) had less than a year of moderating experience, and thus were junior moderators.

During the course of discussions with all of the participating moderators, we found that most of them were either studying or had recently completed a tertiary-level program in psychology and were interested in using this experience as a means to advance their future career prospects. The community managers were professionals in their line of work and had many years of experience in community work especially related to managing youth mental health. The

ReachOut participants (for all the workshops and the interviews) comprised four female and one male moderators and one male and one female community managers. The moderators were aged in their early 20s; the community managers were in their early- to mid-30s.

The researcher-designers initiated and facilitated the discussions and activities in these workshops as well as the interviews. During the focus group and interview discussions, the researcher-designers encouraged the ReachOut participants to elaborate, elucidate, or reiterate their discussion points so that the researcher-designers could understand the lived experiences of the moderators and community managers. Other, more hands-on activities engaged the researcher-designers and ReachOut participants performing similar or balancing roles. The recommended participant group size—tiny (2-4) to small (6-8), as recommended by Muller and Kuhn (1993)—was reached for both workshops to match their participatory design goals.

Initial Workshop

The initial workshop was conducted with focus group discussions interspersed with creative participatory activities that were designed to elicit responses and reveal underlying motives of the intended end users. These activities included (a) brainstorming, (b) affinity diagramming, (c) sketching, and (d) role-playing in the online chats. This workshop involved four ReachOut participants—two community managers employed full-time by ReachOut and two experienced moderators (who participated remotely via Skype), and four researcher-designers. The workshop lasted for 2 hours. Activity worksheets were emailed to the remote participants, who returned them through email after the activity sessions.

The session began with an informal introduction and ice-breaking session for the first few minutes. We followed it with a semistructured discussion of the moderators' motivations and experiences of volunteering with ReachOut. The discussion was cued in the form of open-ended questions drawn from some of the areas of research interest (see end of section Chat Trial), such as "What do you do as a moderator?," "Why do you work as a moderator?," and "What kind of forum activities are you doing?" The discussions flowed organically most of the time, but were controlled using discussion cues by the researcher-designers if the participants deviated too far from the topic or if the process became prolonged.

The initial discussion was followed by a simulated chat with a moderator using an off-the-shelf chat tool in which one of the researcher-designers adopted the persona of a potential visitor (e.g., a young person seeking information on drug abuse). The moderators worked together to maintain the conversation while openly discussing the visitor's likely motivations and needs and the rationale behind each dialogue move.

The session then moved on to brainstorming and affinity diagramming that involved structuring ideas using Post-it Notes. The ReachOut participants were asked to think about and discuss situations that would be concerning in an online chat conversation and, conversely, to envision an ideal conversation. They also were asked to describe a situation or visitor that would be difficult to deal with and, conversely, a situation or visitor for which they could imagine the conversation going particularly smoothly. The responses were jotted onto Post-it Notes as separate points and gradually structured by all the participants into four topics: concerns, ideal, difficult, and straightforward (see left portion of Figure 1).

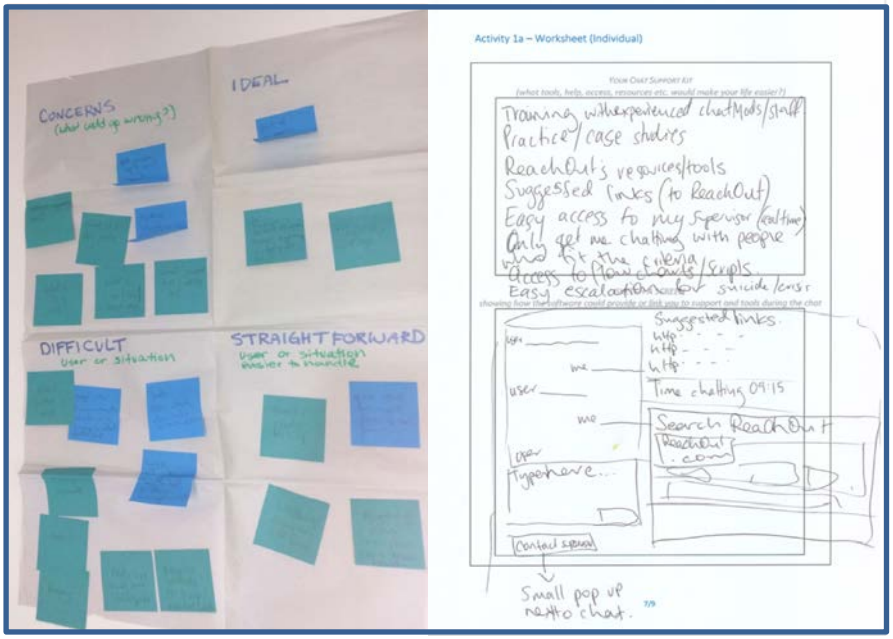

Figure 1. Affinity diagramming (left) and sketching (right) activities in which ReachOut moderators, community managers, and researcher-designers participated during Workshop 1.

Participants then were asked to sketch a "support kit" of useful resources for the chat system. The goal was to generate additional creative insights into the moderation work based on the understanding of the moderators (see right portion of Figure 1).

Two additional simulated chats were conducted via the same protocol described previously. In the first chat, we used the persona was of a concerned youth worried about her friend's drug abuse (see Figure 2), the second of a severely depressed visitor at risk of harm.

Although the primary objective of the workshop was the design of the chat tool, the researcher-designers kept open minds toward other possible digital solutions during the discussions and creative activities. In particular, they avoided presenting any leading questions or cues.

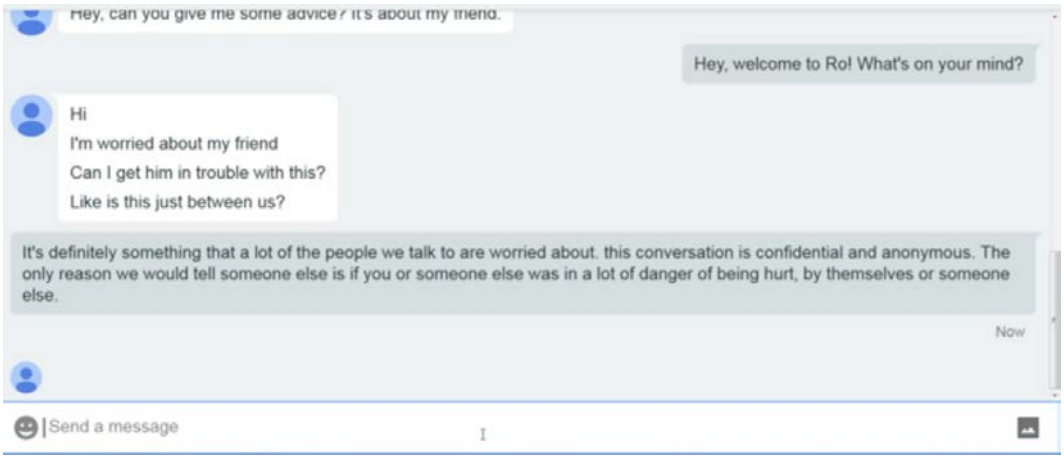

Figure 2. Screenshot of the simulated chat during Workshop 1, where ReachOut moderators and researcher-designers role-played visitor–moderator interactions.

Individual Interviews

Individual interviews were conducted with two moderators, each with less than a year of volunteer experience at ReachOut. These interviews were conducted remotely via Skype, each with one researcher-designer and one moderator. The discussions lasted less than an hour—55 minutes and 45 minutes for Interviewees 1 and 2, respectively.

The interviews were semistructured. Although the researcher-designers provided discussion prompts related to a series of topics of interest, the moderators were encouraged to add to the discussion wherever relevant and were asked probing questions whenever needed. The questions were similar to the ones asked in the focus groups from Workshop 1. Each interview began with a discussion of the participant's motivations for volunteering and his/her experiences. It then moved to simulated chat sessions in which a researcher-designer adopted the persona of a potential visitor and communicated exclusively via the text-based features of Skype. The participant was encouraged to respond via text while explaining his/her thought process via audio. Later in the interview sessions, the moderators were asked open-ended questions to discuss concerning, difficult, straightforward, and ideal situations and visitors.

Follow-up Workshop

A second workshop was conducted with three participants—one community manager and two moderators (one moderator and the community manager also participated in the first workshop). The purpose of this workshop focused more specifically on the design and features of the potential chat system. The discussion questions were the same as the first workshop to provide a quick recapitulation of earlier points but were time-controlled in order to provide more time for the prototype discussion. The discussions also revisited the topic points—concerning, difficult, straightforward, and ideal situation/visitors—although this time the points were structured categories based on the previous workshop findings. This workshop repeated the simulated chats as the previous workshop but, instead of using an off-the-shelf tool, the participants used a working prototype of the system we will describe in later sections of this paper. Also, rather than researcher-designers alone adopting the visitor personas, the participants themselves alternated between the visitor and moderator roles using personas that were assigned to them by the researcher-designers.

After a firsthand experience with the high-fidelity prototype, the moderators and community managers then discussed the various features of the prototype, as well as its perceived usefulness and whether anything could be improved. For instance, one of the moderators used the term "sticky note" to describe how an ideal tool would help him compartmentalize his thoughts while moderating. The researcher-designers used this and other insights from this workshop to further refine the prototype. The Workshop 2 lasted for 2 hours. Table 1 consolidates some of the information gained from the workshops and interviews.

Analysis

The primary method of collecting data was through audio recording. One of the researcher-designers present during all events transcribed the audio data from the interviews and focus groups/workshops.

Table 1. Summarized Details About the Number of Participants, Overall Duration, and Methods and Activities Associated with the Data Collection.

	ReachOut Participants	Researcher-designers	Overall duration	Methods/ activities
Workshop 1	2 senior moderators 2 community managers	4 researcher-designers	2 hours	Semistructured focus group discussions Brainstorming and affinity diagraming Sketching Role-playing in chat simulation
One-on-one interviews	2 (separate sessions) with junior moderators	1 researcher-designer for each session (also present in both workshops)	Interview 1: 55 minutes, Interview 2: 45 minutes	Semistructured interview discussions Role-playing in chat simulation
Workshop 2	2 experienced moderators (1 participated in Workshop 1), 1 community manager (common with workshop 1)	3 researcher-designers (2 participated in Workshop 1)	2 hours	Semistructured focus group discussions Brainstorming Sketching Role-playing in chat simulation

Transcripts from the interviews and the focus groups/workshops were analyzed using the general inductive approach (Thomas, 2006). This approach uses inductive analysis, where the readings of the raw qualitative data are used to derive themes or concepts. The goal is to avoid any structured constraints influenced by predetermined objectives. Two researcher-designers (first two authors) closely read the texts of the transcripts (including one who transcribed the recordings), independently analyzing the transcripts. During the readings of the transcripts, each researcher-designer identified specific themes, with the aim of capturing the primary messages that the participants conveyed. Consideration was given to the following while outlining the themes: frequency (how often the concept was mentioned), intensity (strength of the comment), specificity (detail of the response), and participant perception of the importance of the concept (Krueger, 1997). An example of a prominent theme is "Building rapport with the visitors." Some examples of quotes that indicated building rapport with the visitors are *"Trying to ask a lot of questions to get them talking to build up that rapport"* (Moderator 3), and *"A good chat is when you are really engaging with the user. You form a connection with them based on what they have said to you"* (Moderator 4).

During the course of combining the two independent sets of themes, the researcher-designers noticed that many themes expressed similar ideas. For instance, the theme "Following community guidelines" represented comments of this nature,

> *So, the user is in a highly emotive state; they might be prone to say things that are inappropriate or just in the heat of the moment. And if that is the case, you are unable to offer them full support. You have to outline what the guidelines are and inform them of that."* (Community Manager 1)

Meanwhile, the theme "Getting help if required" included comments such as, "*This is the point where someone else should come in and support the chat*" (Community Manager 1). Because of the similarity in suggesting the same outcome for the moderator, these related comments were combined into a new theme, called "Providing support and guidance to the moderator." On the other hand, the theme "Promote use of the forum" contained only one coded comment, from Moderator 2, "*You're also heaps welcome to come and have a chat to us on the forums if you need anything else. We're here for you. forums.reachout.com,*" and was thus discarded.

The process of coding, identifying, and combining themes was repeated a total of three times, when agreement between the coders was achieved. We discuss the resultant themes in the next section.

RESULTS

In this section, we describe the themes that emerged during qualitative analysis. We categorized the themes into (a) those that relate to participants' current skills and experience and whether they feel equipped to provide real-time chat support; (b) those that relate to why they would be motivated to volunteer; and (c) the specific details of what the service should try to do and how.

Confidence and Concerns

Participants were generally optimistic and confident about potentially assisting help-seekers via real-time chat. In many ways, they saw it as a natural extension of their existing duties moderating the ReachOut forum. They felt confident that their previous experiences had given them knowledge of and access to a large amount of useful information to share. This included reference materials hosted on ReachOut.com and elsewhere, past conversations posted in the forum, and external services (e.g., HeadSpace, Kids Helpline) for referrals to visitors when appropriate. They considered themselves as just one component in the overall holistic framework for treating these troubled youths.

> *But then there is the community outside as well: family members, parents and other supports, other specialists, crisis services. We are often the beginning of a much bigger, longer journey with a lot more sort of variation, a lot more types of support. We are part of the journey and we push it along in the right direction.* (Moderator 4)

As peers, they saw themselves as uniquely well equipped to offer support with empathy and encouragement. "*The support that peers can give to each other: That is quite separate and different and unique to the support* [you can get] *from self-help or professionals*" (Moderator 2).

However, the participants also expressed concern that the chat service would be more likely to place them outside of their areas of expertise. In the forum, they have a great deal of control over which topics and users they engage. However, in a chat service, they might be assigned to a visitor for whom they have limited capacity to relate to, and conversations might quickly traverse into areas of which they have little knowledge or experience.

Motivations for Participating

When asked about their motivations for volunteering at ReachOut forum, some moderators mentioned motivations related to the greater good, such as making a difference to peoples' lives

and contributing positively to society. The respondents stated that they perceived ReachOut as a safe place in which they could make meaningful contributions by facilitating healthy discussions around the various issues that affect young people. These involve "*building capacities in our community of young people around understanding, recognizing, and supporting"* (Community Manager 2). They also appreciated being part of the online community of peers: "*Yeah, I really enjoy working for ReachOut. It feels like home*" (Moderator 3).

In addition, several participants saw ReachOut as a stepping-stone toward a career in a related field. Disciplines such as psychology and community work came up quite often when discussing their motivation: "*I come from a psychology background. I was looking to get experience within the field of psychology in order to help me to progress further in my career"* (Moderator 1).

Goals and Priorities for the Service

Participants had some very specific feedback about how the chat service should be conducted. We provide these details in the following subsections.

Build Rapport with Visitors

One of the most prominent themes to emerge during the analysis was the need to build a strong rapport with each visitor. This was seen as particularly important during the early phases of a chat conversation, to help visitors feel at ease: "*We don't want to just straight jump into it* [the problem] *either. Like, this is our first interaction with this person, so how are we going to make them welcome?"* (Community manager 1).

Participants predicted that some visitors would have difficulty opening up. Additionally, in some cases, the cause of distress would be ambiguous, and visitors would need help navigating through their emotions, such as *"Someone who is not really self-aware and unable to tell what's going on but obviously is really struggling. So, the challenge is to ask the right type of questions and build the type of rapport"* (Moderator 3).

Uphold Visitor Autonomy

Participants felt strongly averse to prescribing direct solutions to visitors. Instead, they felt the best approach was to empower visitors to formulate their own plans and strategies: "[Our job is to] *help someone make some decision on what they should do next, rather than offer up solutions exactly ourselves"* (Moderator 4).

This autonomy-supportive approach was demonstrated during the simulated chats. The participants were careful to avoid prescriptive statements and wary of jumping to a solution too quickly*: "I am careful to not give direct advice; I guess we are not exactly trained to directly counsel our users. So,* [I] *don't want to exactly tell what the person what to do"* (Moderator 2).

When it felt appropriate during the interaction, moderators would share resources that they felt might be relevant and useful but would generally offer multiple options and avoid making any decisions on the visitor's behalf. "*We have a bunch of resources on our site, so if it's cool, I can give you a few links, but we can also keep chatting too!"* (Moderator 1). *"Which ones do you want to pick? How do you want to take them?"* (Moderator 3).

A community manager explained that this focus on autonomy is a core guideline for the organization, which aims to follow a strengths-based approach to working with young people. *"This is where I am using a strengths-based model to get them to think about ways to help themselves"* (Community manager 1).

Preserve Anonymity and Maintain Boundaries

ReachOut's existing peer-support services are provided anonymously as part of their commitment to providing a safe place for young people to share their private struggles. New users are warned not to enter any identifying information when they create their public profiles, and to not reveal their own (or anyone else's) identity when posting messages on the forum. One of the moderators' core responsibilities is to locate any identifying information on the forum, redact it, and remind users about this policy.

Participants were keen for the chat service to remain anonymous also, given that it would have the same goal of providing a safe place for a young help-seeker to open up. The preference for anonymity extended not only to the visitors' identities, but also to their own. The participants acknowledged that the need for anonymity could have a negative impact on their capacity to build rapport or conduct follow-ups with visitors. A good compromise would be to adopt existing forum user-names and profiles so that visitors would have at least some knowledge with whom they are talking. This would also facilitate making contact via the forum after the chat.

Follow-up with Visitors about Postchat Outcomes

Given the focus on building empathy and rapport during each chat, participants felt it would be natural and desirable to continue checking with them [visitors] from time to time after each chat. *"Follow up questions. Ask them how they are doing, or how their appointment with the psychologist went. Making it a bit more personal for them is a good thing"* (Moderator 1).

They were also keen to know if visitors would follow through with the advice and suggestions they were given. This was seen as valuable information for refining their approach to future conversations, as well as for gaining some validation and positive feedback that these conversations would have a meaningful impact. It would likely be an important component for maintaining long-term motivation and engagement. However, participants also recognized that visitors would be difficult to contact for follow-ups if the service were entirely anonymous. They also felt that it would be important to respect visitors' autonomy and ensure that they had a say in whether any follow-up contact would be made and what form it would take. One simple solution they proposed was to end each chat with an invitation to join the forum and continue the conversation there: *"We're on the forum all the time so come visit"* (Moderator 3).

Respect Moderators' Time and Effort

The participants expressed concern that some conversations or portions of conversations would be a poor use of their time. For example, *"Someone pops up and says 'I wanna chat. How are you guys?' and it's got literally nothing to do with anything and it doesn't go anywhere"* (Moderator 2).

Some specific situations that they considered likely to occur were

- Visitors outside of the target demographic (i.e., Australians aged 14–25) who they, would not be well equipped to help,
- Visitors who intentionally waste time to provoke a reaction (i.e., trolls),
- Visitors who prolong a conversation after it has run its natural course,
- Visitors who do not have anything specific to discuss.

One way to counter these potential situations was to set the right expectations at the start of the conversation: *"…setting the expectations at the beginning so that users do not expect that moderators have infinite time"* (Moderator 4). They also thought it would be useful to have a predefined set of guidelines that could be consulted and cited when visitors engage in undesirable behavior. *"It seems to be like an inappropriate use of the ReachOut service. So,* [I] *need to inform this user of that and outline the guidelines"* (Moderator 3).

A similar document already exists for ReachOut's existing forum and acts as a reference for how users are expected to treat each other. These community guidelines are consulted and cited frequently when dealing with undesirable behavior in the forum and was characterized as mutually beneficial for all involved parties. In addition to that, some participants suggested that they would feel more effective in their work if the system could screen out ineligible visitors, trolls, and those without specific needs.

Provide Guidance and Support for the Moderator

Participants expressed some concern that they have only limited training and will likely encounter situations for which they are not equipped to manage. The moderators would themselves require help on occasion. They recognized that the proposed chat service would be more problematic than the existing forum, where they can choose which posts and users to interact with and can take more time to conduct research and formulate responses.
One reason they might feel out of their depth would be if they encountered a specific circumstance or domain for which they had little training or personal experience to draw from, as Moderator 5 indicated.

> *If someone is in a novel situation that, for whatever reason, you feel not equipped with the proper knowledge about services or other information to provide to the user, then you feel unsure what to do. In such an instance, you want to be able to refer to someone else to get your own sort of assistance.* (Moderator 5)

Distinct from this was the concern that some chats would put them out of their depth simply due to the intensity of the situation. *"Maybe the person is in a really difficult situation; maybe you don't feel equipped to support them in the best way. I guess you need some form of support for the person running the chat as well"* (Moderator 3).

One possible avenue of support that the participants mentioned was to have a reference guide that provided specific steps to follow in various situations. The participants explained that they made frequent use of an existing handbook when moderating the forum. Perhaps this could be adapted for the chat service. *"In a particular area, I would feel less equipped to help someone, but that's what the youth moderator handbook is* [for]. *I followed the directions in there to approaching those kinds of requests"* (Moderator 4).

However, the moderators also recognized that, due to the time constraints imposed by the real-time chat service, this handbook would need to be concise and easy to draw from and/or

thoroughly internalized through training and experience. *"Yeah, quick links, kind of like if they are talking about anxiety, depression or whatever, have useful, professional kind of services that you might want to add"* (Moderator 4).

Another avenue mentioned was to provide direct access to a supervisor (i.e., the community manager), who would be able to quickly offer guidance and advice, or even take over particularly difficult or risky situations.

> *So, they might say something like, "It's OK. It won't matter soon." It might be as simple as that. And that is the point where it's probably good for me* [the community manager] *to get involved to help you guys with the risk assessment kind of thing.* (Community manager 1)

Participants also thought it would be useful to be able to offer advice and support for each other—regardless of any seniority. Because they are likely to have different areas of expertise, they could share the workload and stress of having to rapidly compose responses and identify relevant resources.

Find the Right Person for Each Visitor

Participants were concerned that they might not be equipped to help all participants equally. They felt it would be important to assign each visitor to the person best equipped to help them and suggested this could be achieved by allowing moderators (or their supervisor) to specify their level of expertise and the types of conversations that would best suit their expertise. Community manager 1 noted the importance of being able to position moderators in a way that allows them to be successful: *"…being able to assign topics based on skill levels, like 'This person is really new, but they're OK with basic advice from referrals. But they're not OK with crisis and tough time stuff.'"*

The visitor might then be able to choose a specific moderator or be assigned automatically to someone after entering some information about his/her reason for chatting. This information about expertise and topic preference would also be useful for letting moderators know whom to contact if they find themselves out of their depth later on in a conversation.

DISCUSSION AND DESIGN OF THE SYSTEM

Since conducting the workshops, we have designed, developed, and temporarily launched an initial version of a chat system customized specifically to ReachOut's needs. We discuss here the features of this system and how these features reflect the resultant themes and insights drawn from the discussion and activity data.

From the perspective of the visitor, this system differs little from other automated chatbots used in e–commerce and on other Web sites. As shown in Figure 3, it is a small widget that appears on bottom right corner of the ReachOut Web site. The widget will follow the visitor as he/she browses the site, allowing him/her to maintain a conversation and chat about the material encountered.

Figure 4 provides an overview of the system from the perspective of the moderator. The interface is divided horizontally into three main areas: a main menu on the left, the content of the current conversation in the middle, and secondary information or features related to the current conversation on the right.

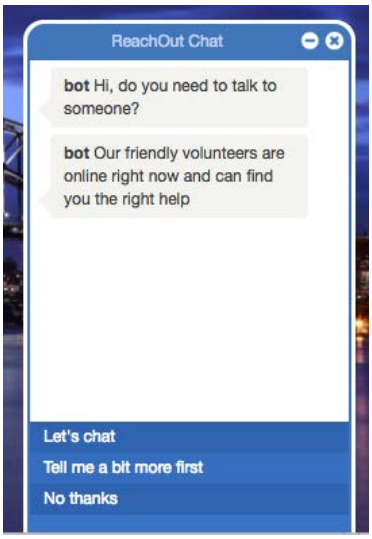

Figure 3. The ReachOut chat system from the perspective of the visitor.[5]

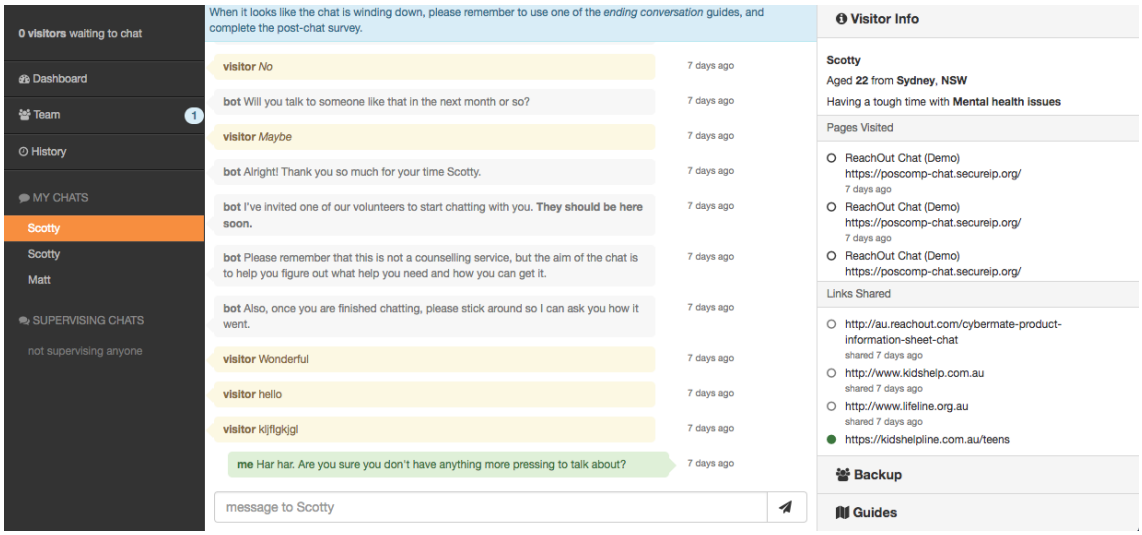

Figure 4. The ReachOut chat system from the perspective of the moderator, here at the start of a chat.

The main menu provides information about the number of visitors waiting to chat and a button to begin chatting with the visitor who has been waiting the longest. Below this are links to the dashboard (with statistics on how many people are on the ReachOut Web site, how many people are currently chatting, etc.), the team page (a place for moderators to chat with each other and know which other moderator is currently online), and a history page (providing an overview of the past conversations of the moderator).

The panel to the right in Figure 4 shows the visitor info, which includes some basic details about the visitor, the pages he/she has visited recently on ReachOut, and a list of URLs that have been shared in the conversation so far. A filled-in circle beside a link indicates that the visitor has clicked it, while those with an empty circle remain unvisited. The remainder of this section will describe the key features of the chat system in more detail.

A Bot to Conduct Surveys and Automate Screening

We implemented a scripted bot that all visitors initially chat with before they can talk to a moderator. This bot, as shown in Figure 3, begins by welcoming the visitor and offering an explanation about the purpose of the service and with whom they would be chatting. It goes on to ask screening questions (about age and location) and gently refers ineligible visitors on to alternative services (Figure 5).

After obtaining informed consent, the system presents a short survey. Much of this survey is a requirement of our research protocol, but it is also used to give the moderator a head start on who the visitor is and what he/she intends to talk about (see the top right of Figure 4). In the future, this feature also could be used to help assign the conversation to the most appropriately skilled moderator. At the end of the survey, the bot explains that someone will be along soon, and all moderators receive a notification that someone is waiting to chat. After the moderator concludes the conversation, the bot returns to ask a short follow-up survey (Figure 6).

A Lightweight User Identification System

To identify the moderators for follow-up purpose, the system retains the usernames already established on the ReachOut forum and uses the existing forum accounts to authenticate. In this way, visitors who are forum regulars would be able to recognize with whom they were talking, and new visitors would be able to locate the moderator on the forum if they wanted to know more. The bot that conducts follow-up surveys also invites visitors to contact the moderator via the forum if they would like to have a follow-up conversation.

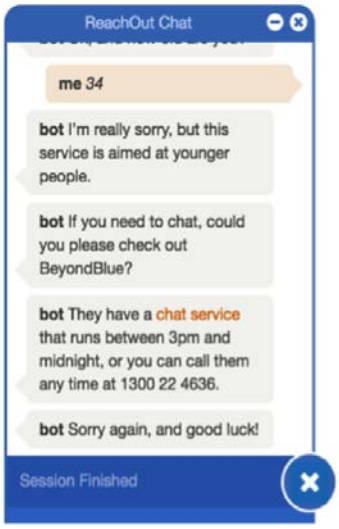

Figure 5. An automated bot screening out an ineligible visitor in the ReachOut chat.

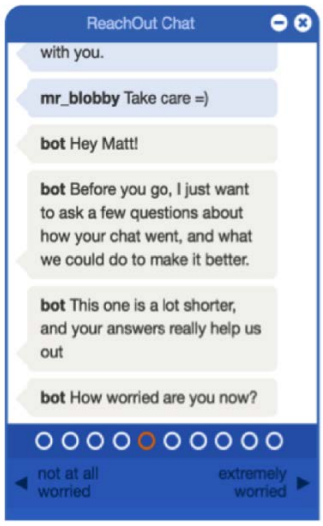

Figure 6. Automated bot following up with a visitor once the visitor–moderator chat is over.[6]

To identify visitors who use the chat, we chose not to require any login or authentication out of concern that it would add an unnecessary roadblock to adoption and could dilute the message that this is a safe and anonymous place to chat. Instead, the bot that initiates the conversation asks the visitor to provide a first name or nickname. This gives both the bot and the moderator something to refer to visitors by and begin building rapport.

Interactive Guides for Difficult or Repetitive Situations

The right side of Figure 7 shows the range of interactive guides available to the moderators. Each guide was designed for a specific situation that is likely to be particularly difficult to resolve or expected to occur often and for which it would be desirable for moderators to behave consistently while expending as little effort as possible (e.g., encountering a troll).

Each page of each guide concisely describes a goal for the moderator (i.e., a dialogue move), and a series of suggestions of what to say to accomplish this goal. For example, the guide for "This conversation is dragging on" first asks the moderator to explain gently that the conversation is running over time (Figure 8a). The moderator then offer the forum as an alternative venue to continue the conversation (Figure 8b). Finally, the moderator encourages the visitor to sign up for the ReachOut forum if he/she is not already a member (Figure 8c). Each suggested message can be edited freely before it is sent to the visitor so the moderator maintains full control of the conversation. The content and tone of each guide was developed through close consultation with ReachOut's community managers.

A System for Moderators to Assist Each Other

To allow moderators to assist each other, we developed the backup features. When a moderator determines that he/she requires backup, an alert is displayed to everyone who is currently online.

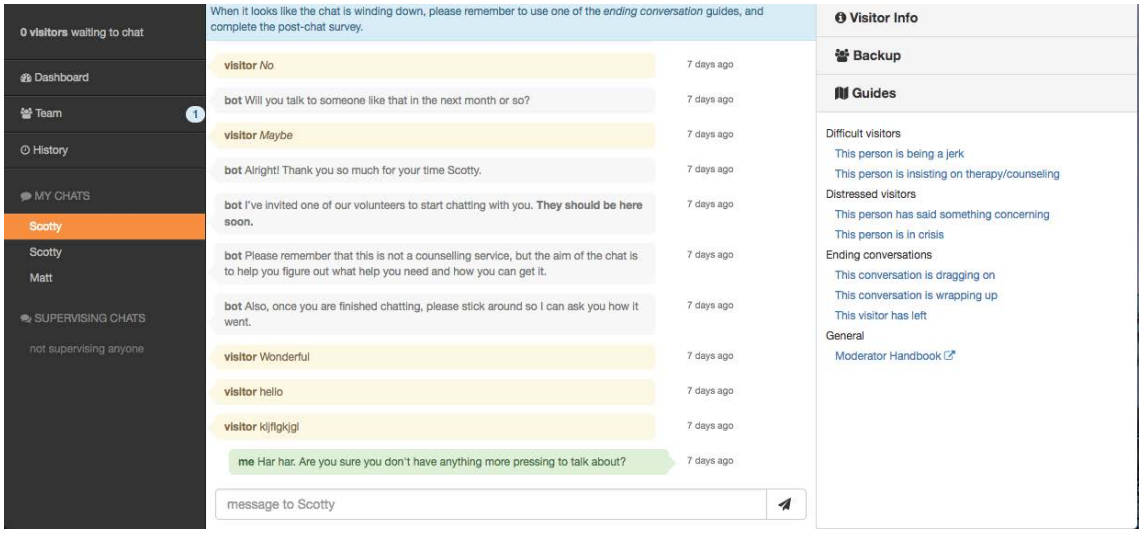

Figure 7. Interactive guides to help moderators during difficult or repetitive situations in the ReachOut chat system.

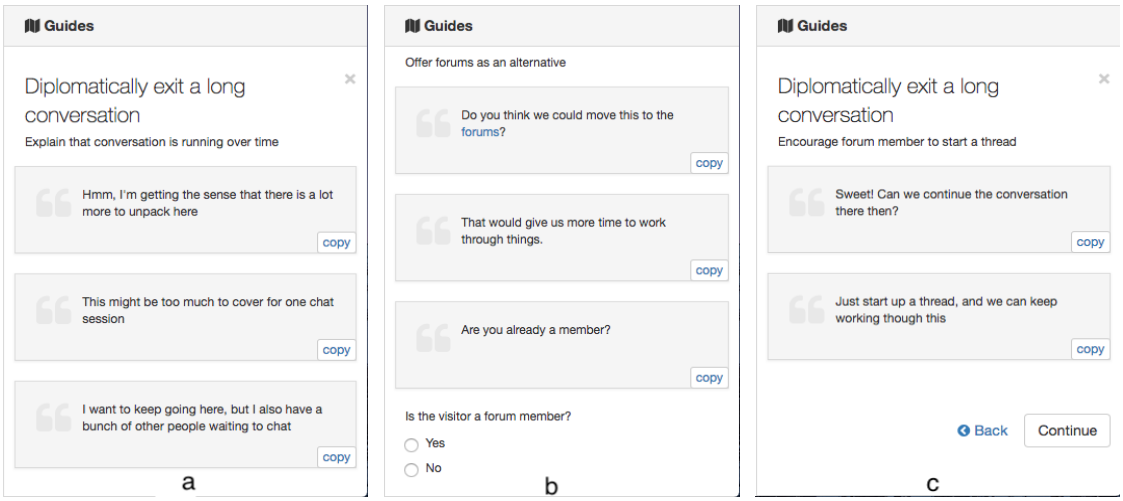

Figure 8. An interactive guide in the ReachOut chat system to help the moderators end conversations that have run over time.

(see Figure 9). Moderators who respond to this alert are shown a page containing the full conversation with the visitor on the left and a secondary conversation between the moderators on the right. Only the original moderator is able to respond directly to the visitor via the conversation on the left, but others can offer advice and suggestions via the conversation on the right.

Additionally, a community manager can view all conversations that are currently occurring and can monitor an individual conversation via the interface shown in Figure 9, even if a moderator has not yet asked for backup. As shown at the top of this figure, a supervisor holds the opportunity to "jump in" and contribute directly to the conversation with the visitor if deemed necessary.

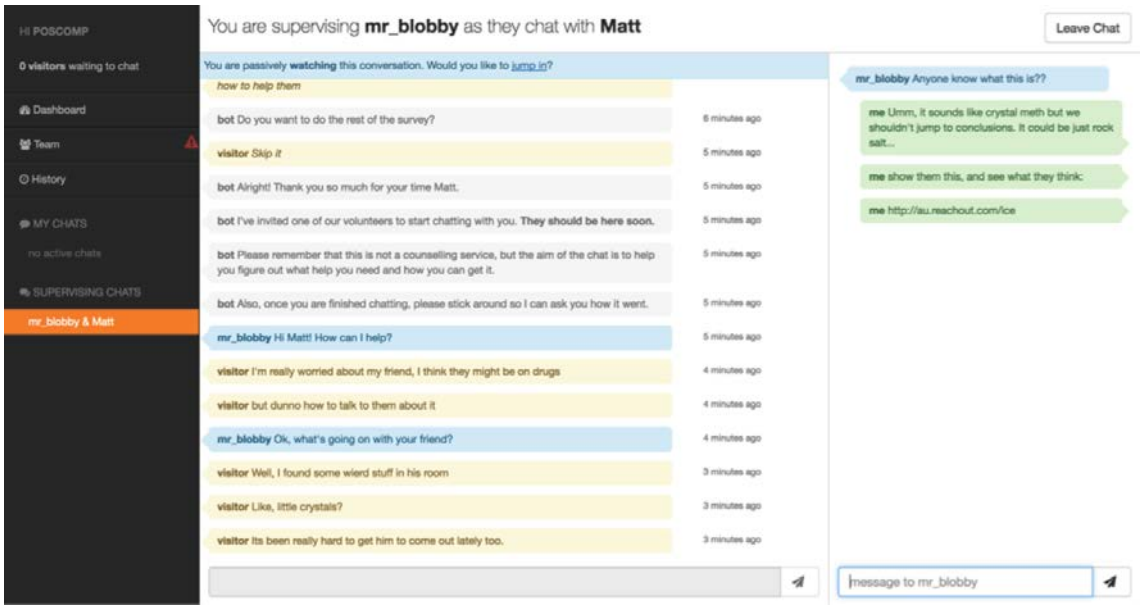

Figure 9. A community manager supervising a moderator–visitor chat in real-time in the ReachOut system.

CONCLUSION

In this paper, we have described the codesign of a real-time peer-to-peer chat support system that provides support to distressed young people and focuses on the volunteers and their managers within the context of a voluntary-sector organization. During the discussions and codesign activities of the workshops and interviews, the participants described their goals, motivations, and experiences. From these, a series of themes were identified that allowed researchers to synthesize several design features for the system.

One limitation of our research is that it has focused exclusively on one side of the conversation: We investigated the needs of the volunteers who provide the service, but not the young help-seekers who will use it. Our rationale for this focus is that the volunteers will interact with the service most often, and consequently, its success depends significantly on fostering their sustained engagement. Another reason for this focus is that we expected volunteers' needs from the system to be complex and nuanced. Thus our research process, in conjunction with the preceding trial, has demonstrated the many opportunities for the system to support and augment the volunteer moderator. In contrast, we expect the help-seeker's needs to be satisfied primarily by the conversation itself rather than the system through which it is conducted. Arguably, from their perspective, the system should remain as simple and familiar as possible; this was a specific aim in the initial design. In future, we hope to use the system described here to recruit young help-seekers into our research to understand better their needs and to address their side of the conversation.

IMPLICATIONS FOR RESEARCH, APPLICATION, OR POLICY

Technology initiatives are, by and large, inefficient in the voluntary sector, and even the sector workers admit to that (Mogus & Levihn-Coon, 2018). This is exacerbated by the fact that modern-day technology gives more power to the common people to initiate and engage in many community-building undertakings that traditionally would have be led by the voluntary-sector organizations. For instance, online advocacy platforms like Avaaz.org or Change.org have given much power to people to initiate and engage in advocacy on their own terms, thus removing the need for external advocacy usually led by voluntary-sector organizations. In order to stay relevant, the funding-constrained sector has to look for efficient and meaningful ways to design technology that would lead to engaged technology usage by the voluntary-sector workers and their end users.

The codesign approach, as illustrated in this study, allows researchers to capture the true essence of the work within a voluntary-sector organization by conducting design research with the volunteers and their managers, whose professional dynamics and interactions guide the design of a needed technology. In our research, resultant product of this approach was a highly tailored online chat system that kept in mind the sociotechnical character of this sector and its distinctive culture, where volunteerism is regarded quite highly. Codesigning technology initiatives for the voluntary sector can help envision better ways to set accountability and adapt the service standards to meet the aspirations of the benefactors, volunteers, and other groups of people working closely with the sector. Specifically, using codesign approach can help in capacity building for newer,

voluntary-sector-appropriate digital paradigms—such as online volunteering, digital charity, and online fundraising—that can be used to fulfill organizational objectives.

ENDNOTES

1. Also known as the third sector, civic sector, joint sector, or social sector. In this paper, we use the term voluntary sector to describe organizations that are nonprofit and nongovernmental. A defining characteristic of this sector is its reliance on volunteerism.
2. Information on this service is available at Intercom.com
3. See www. agilemanifesto.org for additional information on this approach to systems engineering.
4. The research team consisted of technology researchers who contributed to the design of the chat system by providing various skills related to interaction design, software development and user research. Thus, the research team for this study will be hereby referred to as researcher-designers in this paper.
5. The screenshot was taken from au.reachout.com when the chat widget was rolled out temporarily.
6. The screenshot was taken from au.reachout.com when the chat widget was rolled out temporarily. The names in the chats do not represent real people, but the substance of the chats present a tone similar to real conversations.

REFERENCES

Alfes, K., & Langner, N. (2017). Paradoxical leadership: Understanding and managing conflicting tensions to foster volunteer engagement. *Organizational Dynamics*, *46*, 96–103. https://doi.org/10.1016/j.orgdyn.2017.04.005

Anthopoulos, L. G., Siozos, P., & Tsoukalas, I. A. (2007). Applying participatory design and collaboration in digital public services for discovering and re-designing e-government services. *Government Information Quarterly*, *24*(2), 353–376. https://doi.org/10.1016/j.giq.2006.07.018

Australian Bureau of Statistics. (2010). *1301.0—Year Book Australia* (No. 91). Retrieved from http://www.ausstats.abs.gov.au/ausstats/subscriber.nsf/0/AC72C92B23B6DF6DCA257737001B2BAB/$File/13010_2009_10.pdf

Balser, D. (2008). [Review of the book *Nonprofits & technology: Emerging research for usable knowledge*, by M. Cortes & K. M. Rafter]. *Nonprofit and Voluntary Sector Quarterly*, *37*(3), 562–565. https://doi.org/10.1177/0899764007310518

Burns, J., Morey, C., Lagelée, A., Mackenzie, A., & Nicholas, J. (2007). Reach Out! Innovation in service delivery. *Medical Journal of Australia*, *187*(7 Suppl), S31–S34. Retrieved from https://www.mja.com.au/journal/2007/187/7/reach-out-innovation-service-delivery?inline=true

Bussell, H., & Forbes, D. (2002). Understanding the volunteer market: The what, where, who and why of volunteering. *International Journal of Nonprofit and Voluntary Sector Marketing*, *7*(3), 244–257. https://doi.org/10.1002/nvsm.183

Clement, S., Schauman, O., Graham, T., Maggioni, F., Evans-Lacko, S., Bezborodovs, N., Morgan, C., Rüsch, N., Brown, J. S. L, & Thornicroft, G. (2015). What is the impact of mental health-related stigma on help-seeking? A systematic review of quantitative and qualitative studies. *Psychological Medicine*, *45*(1), 11–27. https://doi.org/10.1017/S0033291714000129

Collin, P. J., Metcalf, A. T., Stephens-Reicher, J. C., Blanchard, M. E., Herrman, H. E., Rahilly, K., & Burns, J. M. (2011). ReachOut.com: The role of an online service for promoting help-seeking in young people. *Advances in Mental Health*, *10*(1), 39–51. https://doi.org/10.5172/jamh.2011.10.1.39

Cooper, R., & Foster, M. (1971). Sociotechnical systems. *American Psychologist*, *26*(5), 467–474. https://doi.org/10.1037/h0031539

Davidson, L., Chinman, M., Sells, D., & Rowe, M. (2006). Peer support among adults with serious mental illness: A report from the field. *Schizophrenia Bulletin*, *32*(3), 443–450. https://doi.org/10.1093/schbul/sbj043

Dowling, M., & Rickwood, D. (2013). Online counseling and therapy for mental health problems: A systematic review of individual synchronous interventions using chat. *Journal of Technology in Human Services*, *31*(1), 1–21. https://doi.org/10.1080/15228835.2012.728508

Dybå, T., Prikladnicki, R., Rönkkö, K., Seaman, C., & Sillito, J. (2011). Qualitative research in software engineering. *Empirical Software Engineering*, *16*(4), 425–429. https://doi.org/10.1007/s10664-011-9163-y

Eveleigh, A., Jennett, C., Blandford, A., Brohan, P., & Cox, A. L. (2014). Designing for dabblers and deterring drop-outs in citizen science. In *Proceedings of the 32nd Annual ACM Conference on Human Factors in Computing Systems* (pp. 2985–2994). New York, NY, USA: ACM. https://doi.org/10.1145/2556288.2557262

Fo, W. S., & O'Donnell, C. R. (1974). The buddy system: Relationship and contingency conditions in a community intervention program for youth with nonprofessionals as behavior change agents. *Journal of Consulting and Clinical Psychology*, *42*(2), 163–169.

Guerrini, L. (2011). *Notes on doctoral research in design. Contributions from the Politecnico di Milano*. Milan, Italy: Franco Angeli Edizioni. Retrieved from https://books.google.com.au/books?id=31pHbmBy_bYC

Gulliver, A., Griffiths, K. M., & Christensen, H. (2010). Perceived barriers and facilitators to mental health help-seeking in young people: A systematic review. *BMC Psychiatry*, *10*:113 [online]. https://doi.org/10.1186/1471-244X-10-113

Hoermann, S., McCabe, K. L., Milne, D. N., & Calvo, R. A. (2017). Application of synchronous text-based dialogue systems in mental health interventions: systematic review. *Journal of Medical Internet Research*, *19*(8), e267. https://doi.org/10.2196/jmir.7023

Kautz, K. (2010). Participatory design activities and agile software development. In J. Pries-Heje, J. Venable, D. Bunker, N. L. Russo, & J. I. DeGross (Eds.), *Human benefit through the diffusion of information systems design science research* (pp. 303–316). Berlin, Germany: Springer.

Kristensson, P., Gustafsson, A., & Archer, T. (2004). Harnessing the creative potential among users. *Journal of Product Innovation Management*, *21*(1), 4–14. https://doi.org/10.1111/j.0737-6782.2004.00050.x

Krueger, R. A. (1997*). Analyzing and reporting focus group results.* Thousand Oaks, CA, USA: SAGE Publications.

Leete, L. (2000). Wage equity and employee motivation in nonprofit and for-profit organizations. *Journal of Economic Behavior & Organization*, *43*(4), 423–446. https://doi.org/10.1016/S0167-2681(00)00129-3

Löwgren, J. (1995). Applying design methodology to software development. In *Proceedings of the 1st Conference on Designing Interactive Systems: Processes, Practices, Methods, & Techniques* (pp. 87–95). New York, NY, USA: ACM. https://doi.org/10.1145/225434.225444

McGorry, P. D. (2007). The specialist youth mental health model: Strengthening the weakest link in the public mental health system. *The Medical Journal of Australia*, 187(7 Suppl), S53–S56.

McPhail, B., Costantino, T., Bruckmann, D., Barclay, R., & Clement, A. (1998). CAVEAT Exemplar: Participatory design in a non-profit volunteer organisation. *Computer Supported Cooperative Work*, *7*(3–4), 223–241. https://doi.org/10.1023/A:1008631020266

Merkel, C. B., Xiao, L., Farooq, U., Ganoe, C. H., Lee, R., Carroll, J. M., & Rosson, M. B. (2004). Participatory design in community computing contexts: Tales from the field. In *Proceedings of the Eighth Conference on Participatory Design: Artful Integration—Interweaving Media, Materials and Practices* (Vol. 1, pp. 1–10). New York, NY, USA: ACM.

Milne, D., Hoermann, S., & Calvo, R. (2016, May). A trial of real-time text-based support for young people. Paper presented at the CHI Computing and Mental Health Workshop, New York, NY, USA.

Mogus, J., & Levihn-Coon, A. (2018, February 6). What makes nonprofit digital teams successful today? Retrieved February 20, 2019, from the Stanford Social Innovation Review Web site, https://ssir.org/articles/entry/what_makes_nonprofit_digital_teams_successful_today

Morse, J., Cerretani, J., Halai, S., Laing, J., & Perez, M. (2008). doGooder: Fostering volunteer communities to serve the homeless. In *CHI '08 Extended Abstracts on Human Factors in Computing Systems* (pp. 3843–3848). New York, NY, USA: ACM. https://doi.org/10.1145/1358628.1358941

Muller, M. J., & Kuhn, S. (1993). Participatory design. *Communications of the ACM*, *36*(6), 24–28. https://doi.org/10.1145/153571.255960

Naqshbandi, K., Milne, D. N., Davies, B., Potter, S., Calvo, R. A., & Hoermann, S. (2016). Helping young people going through tough times: Perspectives for a peer-to-peer chat support system. In *Proceedings of the 28th Australian Conference on Computer–Human Interaction* (pp. 640–642). New York, NY, USA: ACM. https://doi.org/10.1145/3010915.3011848

Penuel, W. R., Roschelle, J., & Shechtman, N. (2007). Designing formative assessment software with teachers: An analysis of the co-design process. *Research and Practice in Technology Enhanced Learning*, *2*(1), 51–74. https://doi.org/10.1142/S1793206807000300

Pilemalm, S. (2018). Participatory design in emerging civic engagement initiatives in the new public sector: Applying PD concepts in resource-scarce organizations. *ACM Transactions on Computer–Human Interaction*, *25*(1), 5:1–5:26. https://doi.org/10.1145/3152420

Preece, J., & Rombach, H. D. (1994). A taxonomy for combining software engineering and human-computer interaction measurement approaches: Towards a common framework. *International Journal of Human–Computer Studies*, *41*(4), 553–583. https://doi.org/10.1006/ijhc.1994.1073

ReachOut. (n.d.). Annual reports and financial statements. Retrieved from ReachOut.com About Us on November 16, 2016, from https://about.au.reachout.com/us/annual-reports-financials/

Reyes-Portillo, J. A., Mufson, L., Greenhill, L. L., Gould, M. S., Fisher, P. W., Tarlow, N., & Rynn, M. A. (2014). Web-based interventions for youth internalizing problems: A systematic review. *Journal of the American Academy of Child & Adolescent Psychiatry*, *53*(12), 1254–1270.e5. https://doi.org/10.1016/j.jaac.2014.09.005

Rogers, Y., Sharp, H., & Preece, J. (2011). *Interaction design: Beyond human–computer interaction*. New York, NY, USA: John Wiley & Sons.

Saidel, J. R., & Cour, S. (2003). Information technology and the voluntary sector workplace. *Nonprofit and Voluntary Sector Quarterly*, *32*(1), 5–24. https://doi.org/10.1177/0899764002250004

Sanders, E .B. N., Brandt, E., & Binder, T. (2010). A framework for organizing the tools and techniques of participatory design. In *Proceedings of the 11th Biennial Participatory Design Conference* (pp. 195–198). New York, NY, USA: ACM. https://doi.org/10.1145/1900441.1900476

Sanders, E. B. N., & Stappers, P. J. (2008). Co-creation and the new landscapes of design. *CoDesign*, *4*(1), 5–18. https://doi.org/10.1080/15710880701875068

Schuler, D., & Namioka, A. (1993). *Participatory design: Principles and practices*. Boca Raton, Florida, USA: CRC Press.

Schümmer, T., & Haake, J. M. (2010). PATONGO: Patterns and tools for non-profit organizations: A pattern-based approach for helping volunteers to identify and share good practice. N*ew Review of Hypermedia and Multimedia*, *16*(1–2), 85–111. https://doi.org/10.1080/13614568.2010.499441

Shin, S., & Kleiner, B. H. (2003). How to manage unpaid volunteers in organisations. *Management Research News*, *26*(2–4), 63–71.

Spinuzzi, C. (2005). The methodology of participatory design. *Technical Communication*, *52*(2), 163–174.

Steen, M., Manschot, M., & De Koning, N. (2011). Benefits of co-design in service design projects. *International Journal of Design*, *5*(2), 53–60.

Thomas, D. R. (2006). A general inductive approach for analyzing qualitative evaluation data. *American Journal of Evaluation*, *27*(2), 237–246. https://doi.org/10.1177/1098214005283748

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