

Using Radical Co-Design to Create and Develop a Technology-Based Solution to Improve Post-Release Outcomes for Formerly Incarcerated Women: LindaBot

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Most women exiting prison face profound disadvantages and are likely to struggle with poor mental and physical health. Rarely are women furnished with the resources needed to flourish post-release, and seemingly simple-sounding tasks like getting formal identification are quite complicated. The contributions of lived experience to human service delivery and research are incredibly valuable, yet the ability to contribute meaningfully to interventions is rarely afforded to formerly incarcerated women. Our project seeks to address this gap through the co-design of a chatbot, called LindaBot. In this article, we discuss the method and methodology we used when working with formerly incarcerated women to ideate, design, develop, and test a technology-based solution to support their transition out of prison.

Keywords: chatbot prototype, chatbot, LindaBot, radical co-design, non-reformist reform, formerly incarcerated women, research methodology

A Collaborative Approach to Tech Solutions Supporting Formerly Incarcerated Women

As researchers, we are interested in the ways technology can be leveraged to address social problems and promote social change. While technology-based solutions for women's mental well-being exist, none target formerly incarcerated women (FIW). This article explores the early development stages of our project prototype that seeks to address this gap. We do this by building on our exploratory research conducted in collaboration with members of Seeds of Affinity: Pathways for Women (Seeds), a peer-led local community group that supports currently and formerly incarcerated women.

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Incarceration is a big and growing social problem. More than 10 million adults are being detained in prisons and jails worldwide (Fair & Walmsley, 2021). Since the 1970s, coinciding with the “war on drugs” (Hari, 2015; Stern, 2006), the dismantling of the welfare state (Rasmussen & Kim, 2024), and the rise of neoliberalism (Kendall, 2013), imprisonment rates—especially of the poor and the working classes—have skyrocketed (Reiman & Leighton, 2020; Stern, 2006). In Australia, this is especially the case for women, and particularly Aboriginal women, who make up a far greater proportion of prisoners than the general population (Australian Bureau of Statistics, 2023). According to a recent report by the Committee for Economic Development of Australia (2023), this rise in women’s imprisonment is a result of punitive welfare and other social policies, the high number of women remanded in custody, and inadequate support for women leaving prison, which often set them up to fail. This failure is reflected in the high percentage of women who return to prison within two years of their release.

Women who have been to prison are among the most disadvantaged groups in society. Despite having completed their prison sentence, rarely are they welcomed into the community on release; for many, the only friendships they have are those they made while in prison (Jarldorn, 2020). Post-release, women are incredibly vulnerable to homelessness (Jarldorn, Neill, & Fisk, 2022), and rather than experiencing release as freedom, their release is often poorly coordinated and a scramble for meager resources (Carlton & Segrave, 2011, 2016). The first weeks and months after leaving prison are a particularly risky time for women, with the rates of suicide, mental ill-health, and overdose much higher than the general population (Forsyth, Carroll, Lennox, & Kinner, 2018). Many FIW have experienced a history of violence and abuse leading them to struggle with substance misuse and poor mental health (Stathopoulos, Quadara, Fileborn, & Clark, 2012). Due to their criminal record and their experiences of stigma when seeking medical and human service interventions, FIW are unlikely to seek formal support from a mental health provider (Schnittker & John, 2007), and if they do, are likely to be placed on a waiting list as demand for services significantly outstrips capacity in Australia (Morton, 2022).

In this article, we highlight the value of the lived-experience knowledge held by FIW and explore the potential of artificial intelligence (AI) technologies, in particular chatbots, to support this group in sharing this knowledge with their community. Next, we explore the concept of “radical co-design,” a term we have created to “reclaim” the process of co-design in our own terms. We discuss the process of undertaking radical co-design to assess the post-release needs of FIW and the benefits of using positive, supportive language for this group. We then detail how this process and findings informed the design of the LindaBot prototype. Finally, we discuss how the findings from the prototype development and the radical co-design process inform the future development of LindaBot and invite those working with vulnerable populations such as FIW to apply these findings to their own work.

Valuing FIW and Their Lived-Experience Knowledge

Peer-to-peer support among FIW is recognized as the preferred approach to service provision by this group; it is authentic, meaningful, and trusted (Sisters Inside, 2021). In South Australia, where this research took place, Seeds is the only peer-led and -driven organization supporting FIW (Kilroy & Quixley, 2022). Seeds offers a drastically different but specifically targeted approach to post-release support for women than those offered by mainstream service providers. Seeds’ unique service model uses a combination

of community group activities, social enterprise projects, individual support, and advocacy while actively engaging FIW as providers and recipients of that support. This is important because many models of service available to FIW are rarely helpful or nurturing and often add to women's distress.

Largely unfunded and drawing heavily on the labor of volunteers, including one of the authors who has volunteered with Seeds for a decade, Seeds does not provide mandated programs, but instead, its work is guided by the ethos of "leave no woman behind." Seeds provides caring and judgment-free support to criminalized women on their own terms. Founded in 2006, Seeds began by offering biweekly community workshops and a shared lunch. Over the last 17 years, Seeds' level of service has extended to providing outreach to individuals in the community, one-on-one visits in the Adelaide Women's Prison, and more recently, the delivery of an in-house designed 12-week program, *Nearest Exit*, which helps prepare women for their release from prison. Seeds are also vocal advocates for the rights of criminalized women through public speaking more generally, engaging with government ministers, making submissions to parliament and other inquiries, and participating in research. Much of this advocacy work and individual care and support is provided by Seeds cofounder Linda on mostly a voluntary basis. As one might imagine, in concert with the increasing numbers of women entering and then leaving prison, the demands on Linda's time and lived-experience knowledge to support women leaving prison are enormous.

Given its intimate knowledge about the risks around post-release, Seeds has tried various ways to distribute authentic knowledge and advice to women leaving prison. This is information that is often hidden within complex social service systems that can be circuitous and difficult to navigate. We do not ascribe to the idea that this difficulty in navigating systems has anything to do with any personal deficits or the capacity of FIW women to be resourceful but is an outcome of what Ziggy Bauman described as "the role of bureaucracy in creating and maintaining the socially constructed fantasy of a sanitized social order" (Nisar & Masood, 2020, p. 883). In Seeds' experience, hard copies of printed information become outdated quickly or if left to the criminal justice system to distribute, may never be delivered to the right people at the most useful moment. Alternatively, if the recipient believes that the information came from within correctional services, it is often discounted as inauthentic or untrustworthy. Seeds' experience of the problems that occur when attempting to distribute lived-experience knowledge is informed by the experiences of their members and specifically through a recent post-release suicide-prevention initiative which, when left in the hands of correctional services, was not delivered at the point of exit as was the original intention. This led to extended discussions between Seeds members and the first author about how Seeds could gain control over the information Seeds provides to women leaving prison. This led to our idea of creating a technology-based solution, designed by, with, and for FIW. Originally, we had assumed that a mobile app would be the most appropriate platform, but after conducting our first co-design workshop, we learned that a chatbot could be a better option. However, no "solution" to a complex problem is simple; as McQuillan (2022) identifies, AI is a "layered and interdependent arrangement of technology, institutions and ideology" and is therefore, in no way "neutral" (pp. 1–2), hence it is important to consider the politics of AI.

Artificial Intelligence, Chatbots, and Digital Inequality

Whether communicating with others, shopping online, managing our homes, or locating information, many of us use digital technologies on a daily basis. Artificial intelligence technologies are also

becoming more commonplace across a broad range of settings, including manufacturing and health care, while many of us use free online technologies that aim to make our lives easier (Tambe & Rice, 2018) through tools such as interactive maps and calendars. Chatbots are one such tool increasingly used to enhance and streamline customer service through answers to commonly asked questions (Makasi, Nili, Desouza, & Tate, 2020). A chatbot is a form of AI, a piece of software delivered online, designed to process and resemble human conversation. Chatbots are commonly created and deployed on instant messaging systems such as Messenger (Meta, 2011) by companies for purposes like customer service or sales or by government departments to manage high volumes of inquiries (Makasi et al., 2020).

Although a lot of people would prefer to talk to a “real” person, research shows that users can feel less judged when interacting with a virtual system than when engaging with a human and therefore may feel more confident asking questions about sensitive topics (Rusow et al., 2018). Chatbots also increase accessibility as they can be available 24/7 and, when asked the right question, can provide a much quicker answer than when interacting over the phone or face-to-face (Makasi et al., 2020; Rusow et al., 2018). Online information sources often contain errors, outdated information, or omissions of key information, but through a chatbot, developers can control the information communicated through it by specifically choosing which information is contained in the bot to ensure its accuracy (Rusow et al., 2018). However, while interactivity means chatbots can be made to *appear* more human than other forms of technology such as a website, they are still coded using binary sets of data. As such, all interactive technologies are only capable of delivering information that has been coded within them, the majority of whom are White male developers who (un)wittingly steep sexist attitudes into their work (Spicer, 2023).

Laboria Cuboniks (2018) is a collective of feminists whose *Xenofeminist Manifesto* proposes that “technoscientific innovation must be linked to a collective theoretical and political thinking in which women, queers, and the gender non-conforming play an unparalleled role” (p. 2). It argues that in the 21st century, technology can be either tyrannical or emancipatory. As this project is located within an abolitionist framework (Davis, Dent, Meiners, & Richie, 2021), we seek to maximize the emancipatory potential of technology. However, simply *using* technology to promote social change is not as simple as it may first appear. For example, Madianou (2021) warns that using AI for social good is inevitably “steeped in unequal relations of power” (p. 864), while McQuillan (2022) argues that unless the technology is designed using anti-fascist principles, the harms of bureaucracy will be amplified, especially for marginalized and minoritized populations. Along with the propensity to expand surveillance on the people most likely to be monitored due to their interactions with social services, the bureaucratic categorization and allocation of certain characteristics fed into AI technologies are located within “dominant social, legal, and group norms about utility, purity and normality” (Nisar & Masood, 2020, p. 893). As Park and Humphry (2019) explain, digital automation tools are not always used for social good but instead can be used to “profile, surveil and punish the poor,” facilitating punitive measures and therefore extending disciplinary “welfare” systems (p. 943).

Digital inequalities do not just exist in terms of the extended surveillance experienced by marginalized groups. While it is possible that digital tools can be used to “improve society and fight social injustice” (Tambe & Rice, 2018, p. 3) a digital divide exists, in that it is generally privileged people who benefit the most from advances in technology; in fact, digital inequalities tend to parallel other individual- and macro-level disadvantages (Robinson et al., 2015). This digital exclusion is one of the inequalities

experienced by FIW and has been exacerbated since the COVID-19 pandemic (Blomberg, Altschwager, Seo, Booton, & Nwachukwu, 2021), which has forced more services online. Although the pandemic has highlighted the potential for using technology to reach more people, it has also increased levels of disadvantage as women leaving prison are unlikely to have a phone or have the capacity to purchase one. This situation is particularly compounded for women who have spent years behind bars with minimal access to the Internet or engagement with advances in technology (Reisdorf, DeCook, Foster, Cobbina, & LaCourse, 2022). Therefore, to support women's digital inclusion more broadly, and this project specifically, Seeds secured funding to provide 50 women leaving prison with an Android smartphone and three months' worth of Internet data to help ease their release and to support them to remain in the community. This is important as so many social services, such as Centrelink (Australia's distributor of welfare payments), assume that an individual has access to a phone and the Internet. To ensure that this project is sustainable, once complete, and LindaBot is formally launched, we will begin a campaign where we will simultaneously seek donations of secondhand phones from the public and approach telco companies for extra support.

As Foucault (1995) warned, the seemingly humane practice of surveillance as an alternative form of punishment holds within it power/knowledge that privileges certain groups while sanctioning the oppression of people from criminalized groups in the name of correcting and helping them be "model citizens." An example of this is the 2016 Centrelink "Robodebt" failure, which resulted in hundreds of thousands of debt recovery letters per week being sent to welfare recipients in Australia. Many of the debts raised were several years old and contained multiple errors; a significant proportion of these "debts" were later proven unfounded (Marlborough, 2020; Mead & Barbosa Neves, 2022). It was some of Australia's most disadvantaged individuals who were faced with this experience due to them belonging to the groups that are the most deeply enmeshed in Australia's welfare system, which is managed by the Department of Human Services (Forgione, 2017; Park & Humphry, 2019). This use of algorithmic decision making to make social decisions is what Danaher (2016) and others (Aneesh, 2006) call "algocracy." Danaher (2016) describes algocracy as "a particular kind of governance system, one which is organized and structured on the basis of computer-programmed algorithms" (p. 247). McQuillan (2022) argues that Robodebt should be seen as "algorithmic cruelty," where the damage and distress Robodebt caused was felt disproportionately by people who were unemployed, had a disability, were sole parents, carers, or workers on zero-hour or short-term contracts. Indeed, some Seeds members received Robodebt letters. As a result, many disadvantaged people are choosing to avoid engaging with government agencies for fear of further "administrative" errors (Marlborough, 2020).

Natural Language Processing and Chatbots

Along with the information they provide, the language that chatbots use to engage with end users is an important consideration in chatbot development. Madianou's (2021) work highlights how chatbot technologies often use fixed language conversation as they are usually developed using a predetermined script, created by the developer of the bot. However, Madianou (2021) suggests that rather than "facilitating a meaningful engagement with communities," without careful consideration of the needs of a particular community at the programming stage, the feedback from a chatbot can be "instrumentalized and reduced to formulaic interactions and templates" (p. 858). This experience of automation, when it does not work as the user had hoped, can cause frustration or "rage-quitting" (disengagement) when the chatbot is unable

to understand the question being asked. In response to this, the bot might provide irrelevant information or require the user to begin the conversation all over again (Madianou, 2021). While there have been huge leaps in the development of technologies using natural language processing (NLP; such as ChatGPT), the algorithms that can be implemented by chatbot developers to allow for conversational human-style language still demonstrate large limitations regarding conversational language. While chatbots can be “trained” to “learn” human language from existing data sets or conversations with humans on the Internet, they do not have the capacity to ignore or redact problematic language. For example, Microsoft’s (2016) Twitter bot *Tay*, was programmed to learn from conversations with humans on Twitter, yet it was live less than 24 hours before it was removed due to racist and problematic tweets (Neff & Nagy, 2016; Spicer, 2023).

All of this signals the need for great care to be taken when using technologies such as AI in attempting to improve outcomes for people entangled in the criminal justice system. Having such a level of power and reach means that automated digital tools could easily be created and used to support and promote “reformist reforms” (Gorz, 1967), a type of reform that does not put power in the hands of the end user nor threaten or challenge existing structures of oppression but instead actually works to maintain the status quo. As abolitionists, we are mindful of the harm caused by “reforms” to the criminal justice system, which, in combination with tech-based interventions can “reproduce the criminal justice system’s structural racial violence” (Green, 2019, p. 3). Hence, in this project, we seek to create a non-reformist reform (Ben-Moshe, 2018; Lewis, 2022), one that does not extend the reach of the prison system nor draw on carceral logics (Coyle & Nagel, 2021). One example of a non-reformist reform is the campaign in Australia (and elsewhere) to ban the use of spit hoods, a restraint device that can cause death. This campaign has been successful in South Australia and is gaining momentum across Australia (Rule & Jarldorn, 2024).

Embracing Radical Co-Design to Empower Communities

Sometimes tech development projects are labeled as being co-designed, when instead the process could be better described as consultancy or user involvement at some stages of the project—usually at the testing stage of the prototype. Done well, co-design has the potential to meet three key outcomes: Contribute to human rights, improve service efficiency, and create alliances between services and their users (Greenhalgh et al., 2019) although, as Alford (2014) explains, co-design is often weighted toward services rather than goods.

For us and for this project, we seek to push the boundaries of co-design as far as we can through the sharing of power at every stage of the project. In doing so, we seek to reclaim the term co-design as it was originally intended, where all stakeholders are actively involved across the entire process (Heron, 1996, McKercher, 2020). For our project, this approach is enhanced by working within an abolitionist framework that positions FIW as experts, designers, and owners of the project. We call this approach radical co-design. We conceptualize radical co-design as being a combination of the principles of inclusive participatory action research (Jarldorn, 2022), community-based co-design (McKercher, 2020), and radical social work philosophies (Ferguson & Woodward, 2009) within a prison abolition framework (Davis et al., 2021). Involving and engaging people in developing, designing, and delivering support services leads to greater social impacts, which can be measured when a service or intervention has a positive impact on communities (McKercher, 2020). The input of lived experience is vital when understanding mental health and well-being,

especially for people with the lived experience of prison. Invitations to co-design and coproduce interventions are rarely afforded to women who leave prison. Instead, they are usually shoe-horned into receiving top-down interventions designed by professionals or organizations (or risk returning to prison), with these interventions often designed with the “typical” criminalized male in mind. We call our approach radical co-design because it involves and seeks to empower a community with very little social power in an area they have significant knowledge of, while at the same time, the project does not extend the reach of the criminal justice system. Hence, the project methodology aims to ensure that the *process* is as important as the outcome. This collaborative design process has the potential to be incredibly meaningful for a cohort that tends to be marginalized and socially excluded and is usually told what they will get rather than asked what they want or need. Creating a targeted service intervention that is seen as authentic by the community it seeks to support is an entirely appropriate research and design method as our overarching approach is to privilege the lived experience and cultural knowledge of participants by positioning them as subject-matter experts and co-researcher/designers throughout the life of the project.

When developing LindaBot, we wanted to ensure that ownership of the bot remained with Seeds rather than another organization to reduce the risk of unequal power dynamics affecting the development and design. Non-reformist reforms require the empowering of communities, and as such, it is an important consideration of such a project that Seeds would hold ownership and control of LindaBot throughout the development process and into its use as a tool to support women leaving prison to succeed and as a way to assist Seeds manage demand for their services.

Assessing Access to Technology and Post-Release Needs

Our project was granted ethics approval through the University of South Australia Human Research Ethics Committee #204193. To inform the development of our prototype, we held our first co-design workshop at Seeds’ premises. One of Seeds’ volunteers helped us promote the session among the Seeds community. Thirteen women participated in the workshop, with diversity represented across race, ability, sexuality, age, length of time served, and length of time since release. This was the first release from prison experience for just two of the women, most participants were aged more than 30 years, with the oldest in her late 60s. The workshop was co-facilitated by the lead author and a member of Seeds who was employed on the prototype project as a research associate (RA). We wanted participation in the workshop to be informal and enjoyable, so we designed the activities accordingly. We began by explaining the purpose of the project and ensured that the women understood what participation would entail and how we would use their ideas. Consent forms were signed.

Women worked in pairs and groups of three throughout the session, while the facilitators moved among the groups to listen, provide prompts, and respond to questions. The first activity was modified from an ice-breaker activity devised by one of the authors for use in their teaching. Participants were given a small packet of M&Ms and a color-printed A3 piece of paper (see Figure 1). The women were encouraged to discuss each point among themselves and record their responses directly on the paper. Once the women had exhausted all their ideas, the facilitators guided a discussion about their responses as a large group.



Figure 1. Gathering information with an ice-breaker worksheet.

We then moved on to a second activity, where we undertook a deeper exploration of the themes raised in the first activity. The women brainstormed ideas, writing each idea on a Post-it note; then the notes were grouped into themes on the wall. After the workshop, our RA met three Seeds women individually to capture in writing their “user-journey” or, in other words, their experiences of the first days and weeks after being released from prison. Later, the research team brought together all the captured data to assess and distill the women’s post-release needs. We divided the needs into two groups, depending on whether the need could be addressed—fully or partially—by technology or if those needs were entirely material, and therefore outside the scope of our technology prototype.

Results

We found that the women used different devices to access information, including Android and Apple phones. We also learned that across devices, all the women were already using the platform Messenger to connect with others. Much like other research (Park & Humphry, 2019), we learned that most of the women almost exclusively relied on their mobile phones to access the Internet and often struggled to afford phone credit. Messenger itself can help reduce the use of high amounts of mobile data by allowing users to turn on a “data saver” feature, which limits the amount of data consumed by the platform (Blake, 2022). Along with familiarity with using Messenger, because each of the women was already using it, using Messenger for the project would ensure that those using it would not require access to large amounts of mobile data to download and install, as would be the case with a new app or piece of software.

We then began to explore the types of information that the women sought post-release and consulted with Linda about which tasks she undertook when supporting women in the community. We wanted to know which tasks were dependent on navigating systems—knowing which questions to ask—and where to go to resolve the problem. We learned from the co-design workshops and our consultation with Linda, that what on the surface may seem like a simple act, such as getting formal identification (ID) post-release is incredibly complex, especially if a woman has never had a driver’s license or passport. This is even more complicated if she was born interstate or overseas. Although social workers in prisons can (and should) organize ID for women before their release, often this does not happen. Surprisingly to both of us, neither of whom has been incarcerated, prison ID papers are rarely accepted as formal ID in the community

in South Australia—for example, if trying to open a bank account—yet, without a bank account, individuals are unable to receive any payments from Centrelink. We also learned that it often took hours for Linda to support each woman through the process of gaining formal ID (Jarldorn & Emery, 2022). Throughout these discussions, we were astounded at the remarkable level of lived-experience knowledge Linda held about navigating systems. Once the gaining ID problem was identified, the process to gain formal ID was researched and charted in visual format, through user flow diagrams created in Miro such as that shown in Figure 2.

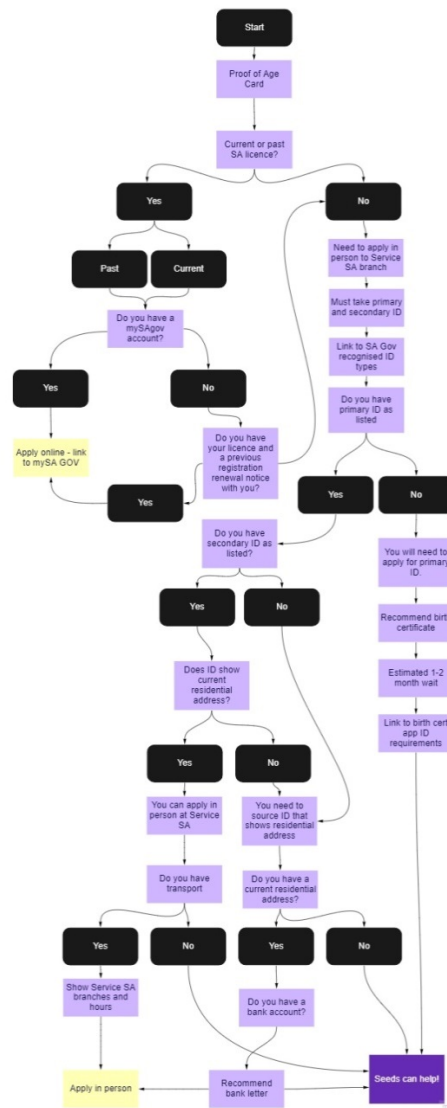


Figure 2. Gaining ID flowchart.

This flowchart demonstrates how many different questions and stages are involved in the process of applying for a South Australian government Proof of Age card, a primary identification document. The complexity of the flowchart demonstrates that it is no simple task and is a visual illustration of the wealth of knowledge held by Linda. Completed flowchart diagrams were returned to Seeds, which provided feedback on the charts, adding sections and notes as required. Only when the flowcharts were paper-tested and approved by Seeds members were they placed inside the chatbot engine. The information inside the chatbot was tested by Seeds, and further changes were made based on their feedback.

Designing a User-Friendly Chatbot Experience

As discussed earlier, when women engage with government services post-release, they experience significant blocks and Kafkaesque challenges (Nisar & Masood, 2020) that resemble the struggles many have experienced through the correctional services system. When designing LindaBot, we wanted to ensure that the information communicated in the chatbot did not create a similar sense of confusion or frustration in its users. Many chatbots, especially those in customer service design, are often developed with a fixed predetermined script reduced to formulas that may not feel meaningful to those engaging with it (Madianou, 2021). It can be frustrating when trying to get support from a chatbot but finding that it cannot understand you or provides incorrect information due to misunderstanding your query. Many chatbots use NLP, an approach that allows users to use conversational language with the goal that the chatbot will respond accordingly. For example, using NLP, a chatbot could be programmed to interpret each of the responses "yeah," "yep," "ok," "yes," or "affirmative" typed by the user as *yes* and provide a response as though the user had typed *yes*. Our initial testing of the LindaBot prototype used NLP, however, an issue arose when a user was asked the question "Do you have a current or past SA [South Australian] driver's license?" and the user responded with "I did have one but not anymore, it expired." The NLP interpreted the word "not" in this sentence as close to the word "no," and responded to the user as though they had never had a driver's license and provided incorrect instructions to this user, a great example of the potential of automation to create confusion or frustration in users (Madianou, 2021).

When developing the LindaBot prototype, we were particularly concerned with preventing incorrect information being provided to users, as FIW are a vulnerable group, and receiving the wrong information could put them at serious risk (Park & Humphry, 2019). In fact, Seeds members shared several stories with us of incorrect information being provided to FIW from workers and organizations, which led to women being placed in harmful situations such as not having access to food or shelter. For this reason, in the LindaBot prototype, we did not use NLP or any form of artificial language interpretation; rather, we provided buttons where the user must choose from a set selection of responses to a question, such as *yes* or *no*, as shown in Figure 3.

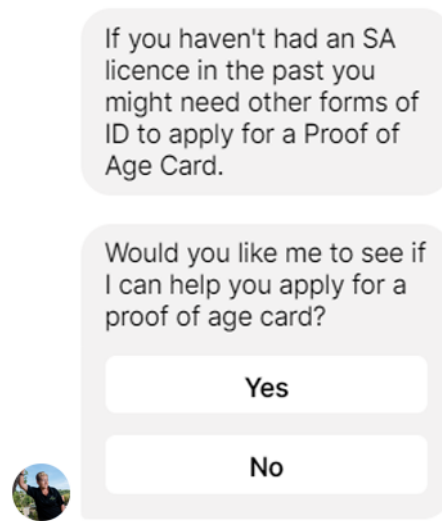


Figure 3. Example of the yes/no buttons.

Taking this approach ensured that we could code the chatbot to fully understand these choices and to contain a relevant answer for each of the choices, thus preventing the confusion and frustration that could arise from misinterpretation of responses using NLP. Some other elements we included in the bot to help reduce the chance of user frustration was an introduction to the bot on first engaging with it, which explains to the user that they are not speaking to a real person but a bot that will try to help provide useful information. LindaBot asks the user if they are currently experiencing a crisis or serious mental health concerns. If they are, LindaBot provides contact details for nationally available 24-hour crisis response services. Next, it checks if the user needs to speak to a "real person" and if so, it invites them to speak to someone at Seeds and provides contact information for this. This is especially important if their question is complex or requires human communication. It also explains how to use the bot and provides instructions on how to access the main menu and contact details to speak to someone at Seeds.

Our co-design workshops also highlighted potential concerns around the collection of personal data by chatbots and the potential for these data to be accessed by others or used for disciplinary or enforcement purposes, a concern highlighted elsewhere (McQuillan, 2022; Park & Humphry, 2019). While the data inputted into the chatbot remain owned by Seeds, the chatbot engine Chatfuel and Meta (as owners of the Messenger client) also have access to this information. Although Meta states that messages sent through Messenger are "private," it also states that it "collect[s] information from Messenger" to improve the service (Meta, 2022, p. 21). Although the security of these data is an area that requires further investigation, the short-answer format was deemed the most suitable for use with FIW as it collects much less personal information from its users than if the user was typing full sentences. We also implemented a message at the start of engaging with the chatbot that lets the user know that any information they share with the bot may not be completely secure, but that Seeds will do its best to ensure the information is not shared with anyone outside the organization.

“The Language of Love”—The Power of Language and Supportive Interactions

Throughout the workshops, we learned that much of the support that was deemed most valuable to the women post-release was provided by Linda, rather than through other organizations or individuals, hence why we named the bot LindaBot. At first, the name LindaBot was chosen as a bit of fun and because it provided a catchy title for our funding applications. However, at a project planning session, we spent some time discussing if the name should be changed to something like AskSeeds, to acknowledge the collaborative nature of the contributions of Seeds women. It was decided that it is Linda who the women currently in prison are most familiar with while keeping “bot” in the title makes it clear(er) that the questions are being answered by a chatbot rather than Linda herself. While technology can never replace Linda, if LindaBot could provide its users with some simple information to complete some tasks by themselves, this might offer scope for the real-life Linda to have more time to provide some of the more complex supports needed in many situations (Jarldorn et al., 2022).

Opting against using NLP in LindaBot due to the potential risk of the bot interpreting users’ responses incorrectly provided more opportunities than challenges, especially as there is a risk of data bias present in NLP data sets. Many consider the Generative Pretrained Transformer-3 form of NLP “indistinguishable from human-generated text based on various criteria” (Caliskan, 2021, para. 12). However, this realism also reveals evidence of human bias, with research by Caliskan, Bryson, and Narayanan (2017) showing that data sets used in NLP contain language that reflects human biases such as racism (Lee, 2018) and sexism (Brown et al., 2020; Caliskan et al., 2017; Dastin, 2018).

Interactions with humanitarian chatbots essentially mean engagement with predefined scripts. While Madianou (2021) proposes that these limited scripts are a shortcoming of chatbots that can make them less able to provide an engaging experience, for the development of LindaBot we saw this as a strength. By avoiding the use of NLP and keeping LindaBot to a predefined script, we could ensure that the language used in the bot did not reflect the potential data bias present in NLP data sets but rather that it was positive and supportive language. The language used in the chatbot was identified as a priority by Seeds during our workshops. At one of our prototype testing and feedback sessions for the Proof of Age ID function shown in Figure 2, we learned that although the women liked the information being communicated through the bot, they felt as though something was missing. The women kept returning to the idea that the way the information was communicated when it came from Linda directly really demonstrated the importance of the Seeds model. For this reason, our LindaBot prototype does not just provide information. Instead, we have programmed it to use the same type of positive, nurturing language based on the approach used by Linda and Seeds volunteers, as shown in Figure 4.

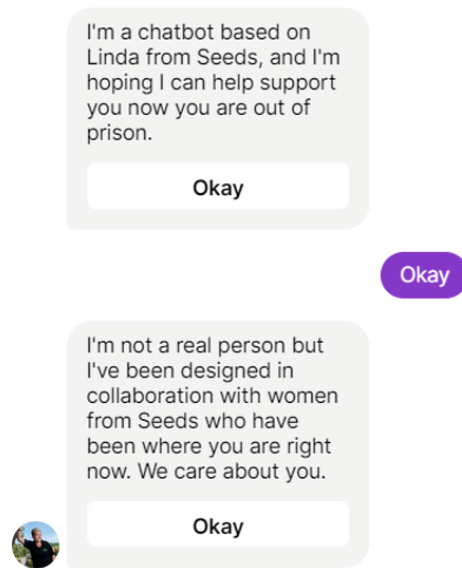


Figure 4. Example of the "Language of Love" embedded in LindaBot.

When discussing the importance of this type of language to meet the Seeds ethos, Linda called it the "Language of Love." This approach to working with FIW is a radical departure from the typical interactions FIW have with service providers are often laden with judgment and disdain. As Seeds—along with other abolitionist organizations—prides itself on doing things completely opposite to the way correctional services do, it seems right to implement this difference into how LindaBot interacts with its users. This approach reflects Alexis Pauline Gumbs' abolitionist thinking. In her chapter aptly titled "Freedom Seeds," Gumbs (2008) asks,

What if abolition isn't a shattering thing, not a crashing thing, not a wrecking ball event . . . what if abolishing the prison industrial complex is the fruit of our diligent gardening, building and deepening of a movement to respond to the violence of the state and the violence in our communities with sustainable, transformative love? (p. 145)

Abolition is not just tearing down prison walls, it is also about transformation and building a community with a "loving culture" (hooks, 2000, xxiv). This is abolition in practice, and as bell hooks (2000) reminds us, "all the great movements for social justice have strongly emphasized a love ethic" (p. xix). Along with using supportive language, the Language of Love also extends to actions, with Linda describing how Seeds members undertake regular check-ins for the first few weeks after the women get out of prison. She highlighted how many of the women found it incredibly useful to hear what was helpful to others when they first got out. In prison and post-release, women are rarely asked how they are or offered emotional support such as this. In interactive media design, there is a concept known as procedural rhetoric (Bogost, 2007), which demonstrates how the rules and processes present inside an interactive experience can persuade or communicate particular ideologies. In our LindaBot prototype, users are asked if they would be

willing to opt for daily check-ins, wherein every 24 hours they receive a message from LindaBot checking in on their mental health and asking if they have any urgent needs. Following this, the bot will share with the user something that one of the women from Seeds had previously found helped her throughout her first few days post-release—this could be information provided through text such as quotes, ideas, photos, videos, sound files, links to music, or other resources. This process aims to use the procedural rhetoric facilitated by the chatbot format to communicate to its users the ideology of Seed’s Language of Love, highlighting to the user that they are not alone in their challenges but that they are a part of the Seeds community. Through this daily check-in process, users are reminded of the informal biweekly catch-ups held by Seeds and are invited to further engage with the Seeds community through in-person attendance at these informal, supportive sessions. This is a great outcome given that over its 17 years of operating, Seeds has observed that the longer a woman engages with Seeds, the more likely she is to remain in the community.

From Prototype to Co-Production: Moving Forward

When reviewing the literature for the LindaBot project, we observed that there are presently some issues around data security and privacy when using chatbots on platforms such as Messenger that require further research and investigation. Therefore, for this project, we decided to reduce the amount of personal information accessed by the bot by programming it to have simple responses such as “yes” and “no” to limit the amount of personal information shared by those engaging with the bot. We also placed an information screen at the start of user engagement, with the bot advising that the information the user shares may be accessible by Seeds volunteers but that we will not collect any data other than their first name and the yes/no responses they provide to LindaBot. Users were also informed that they could stop talking to LindaBot at any time.

Our prototype provided us with proof that our concept worked. Creating the prototype enabled us to find a funder willing to support the project to completion over the next two years. We are now working together to create and compile resources and genuine connections to services that meet the diversity of needs of FIW, which takes into account race, culture, sexuality, and ability. Seeds women have been recruited to create a LindaBot advisory group in a series of rolling paid roles. We ensure that these roles are filled by women who represent the diversity of the women’s prison population. However, the advisory group provides more than “advice.” Its members are involved in multiple roles within the project, including co-facilitating co-design workshops inside the prison and in the community, analyzing data, and working alongside the tech development team to learn how to create and incorporate new content and make updates and changes to LindaBot content inside the chatbot engine. We ensured that we demonstrated respect for the uniqueness of the lived-experience knowledge used to create LindaBot by protecting ownership of the intellectual property (IP). Before proceeding any further with the project, a formal agreement was drawn up to ensure that the IP for LindaBot belongs to, and will remain with, Seeds. It will be their decision to make if they wish to share the IP with their allies in other states of Australia.

While the development of the LindaBot prototype demonstrated the many positive aspects of technology-based solutions for supporting disadvantaged and minoritized groups, we fully acknowledge that technology-based solutions cannot replace human interaction, provide material resources for Seeds women, or undo the harms of imprisonment. But where solutions like the one described in this article are not only

informed by, but also owned, co-designed, and co-developed by end users with lived experience, technology solutions like LindaBot have the potential to be a part of the movement of community-led, abolitionist, and non-reformist reforms, which recognize that the community holds the answers but needs the resources to activate its knowledge.

We also acknowledge that technology-based solutions cannot always help users achieve their needs due to the complicated nature of individual circumstances—sometimes, human-like decision making is required. However, we believe solutions like LindaBot can help those with more complex needs access human support. This is because chatbots can be designed to answer some of the more formulaic questions that might be faced by women post-release, allowing workers like Linda and organizations like Seeds more time for advocacy and face-to-face work.

In terms of the long-term sustainability of the use of LindaBot, digital literacy and training may prove challenging in the future. Although during the development process of LindaBot the women at Seeds will learn to make changes and updates to LindaBot themselves with support from us, software frequently changes, and it is likely that in the future the way these changes are made may need to be adjusted in line with updates to the software. However, all the content created by Seeds will be backed up safely on a secure, password-protected server and external hard drives, while the project has embedded evaluation methods into the development process.

Our ethos of radical co-design was embodied throughout the project development process to ensure that Seeds has ownership over the ideation, design, and development of LindaBot, not just the final product. Volunteer turnover may mean that ongoing training or support materials will need to be provided to ensure Seeds retains the skills needed to update and maintain LindaBot. Hence, we will continue to work in alliance with Seeds to access ongoing training, maintenance, and support for LindaBot into the future. At more than AUD 115,000 per year to imprison one woman, ongoing funding and support to maintain LindaBot would be a small investment with a significant return. Continuing to offer FIW women opportunities to try something new and learn about designing technology as they work together as a collective has the potential to contribute to healing from the sense of hopelessness many feel from the brutality of the prison system through actively contributing to a solution.

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