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Evaluating Ask Izzy: A Mobile Web App for People Experiencing Homelessness

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Abstract. This paper contributes to an ongoing discussion in the research community regarding the role of new technology in the lives of those experiencing homelessness. *Ask Izzy* is a mobile web app designed to help people who are homeless or at risk of becoming homeless find the services they need. Since deployment in 2016, it is now attracting over 10,000 users each month. We explore the perceptions towards the design and use of Ask Izzy with a specific focus on emotional concerns. We interviewed 30 participants who were either homeless, ex-homeless, service providers or software developers of the web application. Seven themes emerged from the analysis that appeared to act as barriers or enablers to the uptake of the technology. We discuss how these themes are associated with aspects of technology design or an associated experience with a service provider. We also contrast the views of those who are homeless with service providers. We believe these themes will provoke discussion and be useful for others who are designing for those who are homeless.

Introduction

There are numerous current societal problems that require us to change the way we collectively work together. Well publicised examples include climate change,

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population health and wellbeing. These (wicked) problems require solutions that consider the broader socio-technical system in order to address the needs of technology users. One particularly challenging problem is homelessness. In Australia, the number of people experiencing homelessness is up 14% in the five years leading up to 2016 according to the Australian Bureau of Statistics. People without an adequate place to live are likely to be frequently seeking help with service providers for a number of years (Humphry (2014)).

This is a unique, urgent and poorly understood challenge with potential for many technological solutions. As a consequence, a growing body of work in CSCW and HCI is calling for an in-depth understanding of the needs of people who are homeless or at risk of becoming homeless. In previous related work, the design needs of vulnerable user groups has been shown to be a unique situation (Vines et al. (2013)), with some research focusing specifically on homelessness (e.g. Woelfer and Hendry (2011); Hersberger (2013); Chatman (1996); Le Dantec and Edwards (2008); Muñoz et al. (2004); Griffiths and Scarantino (2005)). This work raises many questions. For instance, work by Woelfer and Hendry (2011) questions whether this group of users have the means and motivation to access information online. Work by Hersberger (2013) questions whether this group of users already suffer from information overload from existing service providers and whether new information online will just add to the confusion. Finally, work by Chatman (1996) questions whether the lack of economic independence restricts access to computers and internet resources, and limited access to training hinders uptake of digital technology.

It is clear from prior work that designing technology to help those who are homeless needs to be approached in a sensitive manner. In particular, information about emotions as discussed by Norman (2013) is important to consider as people often reject technology if it does not support the way they wish to feel while interacting with it. An increasing body of work now focuses on the way a user wants to feel while interacting with technology (e.g. Hou et al. (2017); Pedell et al. (2017); Toscos et al. (2013)). Users may wish to feel in control, connected, hopeful, cared for, or empowered, among others (Toscos et al. (2013); Pedell et al. (2014); Saffarizadeh et al. (2017)). Information about emotions is still extremely difficult to incorporate and evaluate in technology design as they are subjective and situation-dependent. Also, emotional views about technology are formed and change over time based not only on the actual technology engagement experience but also are layered with associated experiences (Saffarizadeh et al. (2017); Alatawi et al. (2018)). Due to the sensitive nature of this application domain, we use information about emotional experiences to guide our analysis and understanding.

Our research is based on a currently deployed mobile web app – called Ask Izzy – that helps homeless Australians find information about the services they need. Specifically, Ask Izzy was launched in 2016. Ask Izzy contains information about services providers, and currently attracts over 10,000 users each month. There are 16 service categories including food, housing, everyday needs, money help and

counselling among others. We conduct semi-structured interviews with users of Ask Izzy. Participants are either homeless, ex-homeless, or service providers. Based on the interview transcripts, we conduct a thematic analysis. We aim to understand the challenges and opportunities that should be considered when designing similar technology. Consequently, the research question we aim to answer in this paper is: *‘What are the needs of those experiencing homelessness that should be considered in the design of new technology?’*. The analysis contributes to the existing literature as it provides an in-depth understanding of the technology needs for a unique and poorly understood user group: those experiencing *homelessness*. These results may also contribute to literature on value sensitive design (Friedman et al. (2008)).

1 Background

A common misconception is that technology to help those experiencing homelessness is only for those sleeping rough. The Australian Bureau of Statistics defines a person experiencing homelessness as

“...in a dwelling that is inadequate; or has no tenure, or if their initial tenure is short and not extendable; or does not allow them to have control of, and access to space for social relations.”

This typically means that people who are in shelters or transitional accommodation that has been purposefully built for homeless people are also considered to be homeless. The goal of reaching a stable housing situation may take a number of years, and involve frequent interactions with multiple service providers. In this section we discuss related work on technology for homelessness and the importance of considering emotions in technology design.

1.1 Technology for Homelessness

There are many considerations when designing technology for those experiencing homelessness. Currently, most information is exchanged in face-to-face situations (Hersberger (2013); Le Dantec and Edwards (2008)). Providing information online about available services is one way to increase accessibility and help those that are homeless to search and find the help that they need. Prior research has questioned whether access to additional information online is effective. Work by Hersberger (2013) questioned whether those who are homeless are not already overwhelmed by information provided by services. Additionally, the lack of economic independence restricts access to computers and internet resources. Equally, limited access to training hinders uptake of digital technology (Chatman (1996)). One study by Woelfer and Hendry (2011) suggests that we should take a precautionary stance when it comes to providing access to complex service information online and has even suggested that ubiquitous technology may not be the solution to this problem. Additionally, service providers often resist change and reduction in

control over how those who are homeless are accessing information. This is because the new means of accessing information creates expectations upon service providers that they may not be able to meet (Le Dantec and Edwards (2008); Weise et al. (2017)).

Despite the scepticism regarding the effectiveness of communicating complex service information online, there is evidence to suggest it would be beneficial to many. A mobile phone is often viewed as a necessity and a critical lifeline (Le Dantec and Edwards (2008)). A recent study estimated most people experiencing homelessness prioritise retaining their mobile phone to keep in touch with family, friends and necessary service providers (Humphry (2014)). Even those without a smart phone may have access to the internet via alternative means, such as the library or with help from case workers. More recent work by Woelfer and Hendry (2012) investigates the extensive use of social media by young homeless people, highlighting different information seeking strategies utilised by a younger tech-savvy generation.

Those experiencing homelessness represent a unique user group. The major causes of homelessness are outlined in Table I and include family violence, financial difficulties or a housing crisis. Living situations are outlined in Table II. For those in these situations, additional problems often accumulate over time, such as drug and alcohol abuse, creating a viscous cycle (Woelfer and Hendry (2009)). In reaction to these complex needs, services allocate an extensive range of support, and become largely responsible for the diffusion of new information and support to those who are homeless via a mix of government funded organisations and grassroots organisations (Woelfer and Hendry (2009)).

Table I: Causes

Table II: Living Situations

Reason	%	Place	%
Family violence	24	Severe overcrowding	39
Financial difficulties	20	Supported accommodation	20
Housing crisis	16	Temporarily staying with others	17
Inadequate dwellings	11	Boarding houses	17
Other relationship issues	8	Improvised / rough sleeping	6
Other housing issues	5	Other temporary lodging	1
Health issues	4		
Other	12		

Reference for table data:

Homelessness Australia;

ABS;

Chamberlain et al. (2014)

1.2 Considering Emotions in Technology

People will reject new technology if it does not appeal to their emotional needs (Dix et al. (2003); Krumbholz et al. (2000); Norman (2005); Pedell et al. (2014); Miller et al. (2015)). For this reason, there is a growing body of work that aims to use information about emotions of users to improve the design of new technology. In our study, we are not directly measuring an emotional state. Instead we are using information about emotional experiences discussed in interviews as a basis for evaluating the design of a mobile web app for homelessness. We discuss this further in the following section.

While there are a variety of popular psychological frameworks that characterise emotions, their content and utility for system design and evaluation will vary. In this section we give an overview of popular psychological frameworks that do characterise emotion and its influence on technology use.

Some psychological frameworks are grounded in primary (also referred to as basic) emotions such as fear, anger, or joy (Ekman (1992); Schwarz and Clore (1983)). These frameworks can then be used by technology developers to evaluate whether such emotions are incorporated into the technology itself (Sutcliffe (2009); Lowry et al. (2012)). Other emotional frameworks contain different types of emotions, including those that are more reflective. For instance, some emotions are characterised by having relatively lower levels of arousal and involve relatively higher levels of reflective, cognitive processes; examples include the characterisation of shame and resentment (Martin and Tesser (1996); Desmet and Hekkert (2007); Plutchik (2003)).

Emotional experiences associated with technology use may be related to aspects of the software design, such as a particular feature that is displayed. Work on socio-materiality and technology affordances (Orlikowski and Scott (2008); Majchrzak et al. (2013); Vaast and Kaganer (2013); Leonardi (2013)) shows how aspects of design can trigger positive and negative emotional perceptions. Emotional experiences associated with a particular technology are also influenced by external factors, including other individuals or organisations that are associated with the engagement experience. Misplaced expectations may still be attributed to the technology itself due to multiple experiences becoming aggregated and associated with each other (Wood and Moreau (2006)). These experiences could include those occurring during the progression towards a common goal (Clore and Ortony (2008); Luce et al. (2001)) or achievement (Martin and Tesser (1996)). Consequently, in our case study, participants may attribute perceptions related to an interaction with a service provider wrongly to the technology that facilitated the interactions.

Those that are homeless experience a range of different emotions that place poorly understood demands upon creators of new technology. Unfortunately, while there are some studies that focus on designing for vulnerable user groups, and even those who are homeless, these studies do not focus specifically on emotions and also do not evaluate a deployed system that has been designed with these needs in mind.

2 Case Study

2.1 A Mobile Web App for Homelessness

Ask Izzy (Infoxchange (2018b)) is a mobile web app that aims to tackle the problem of homelessness by assisting those who are homeless in finding useful information. It provides information about services in Australia. The listed services provide a range of support from help with health issues, food, shelter through to legal and financial advice. The website was listed as ‘un-metered’ with the network; meaning, it does not cost anything to access. Additionally, battery packs were donated to increase the capability of those in need to use their phones for longer.

A typical use of Ask Izzy involves starting at the landing page shown in Figure 1. A user is presented with 16 *help categories*. Examples of the categories are Housing, Food and Money Help. The user can choose to give their location and is guided through a series of *category-specific questions*. Based on these answers, the user is presented with a *service list* page compiled via a *service filter process* detailing results of services that match their criteria, and ordered by relevance. A user can select a particular service and view its *detailed service page*. The *detailed service page* (Figure 1) displays information about how to connect with the particular service, how to get there, who it is for and what clients should expect.

2.2 Method

Two authors conducted a series of semi-structured, one-hour interviews with 30 participants six months after the deployment of Ask Izzy. We took care to ensure the recruitment procedures and interview locations were appropriate; participants were recruited via existing service providers who were also able to provide a familiar environment for the discussion to take place.

Participants who were homeless had some experience with Ask Izzy. This ranged from a single use to frequent use over the 6 months period of time. Service providers were aware of Ask Izzy and therefore played a role in raising awareness with homeless people with whom they were in contact. Table III gives an overview of the participants that were interviewed. Participants were selected to represent a range of people who have a stake in the success of the application and who have had first hand experience with Ask Izzy. This included those who were homeless, ex-homeless, service providers, and the software company, in a range of situations.

A semi-structured interview was chosen to give flexibility to the conversation. It allowed participants to diverge and discuss contextual factors that may be unexpectedly related to their perceptions of Ask Izzy. With regard to the software design, we asked what they liked, disliked, and what they would change in the mobile app. We also asked how using Ask Izzy made them feel. We discussed interactions and experiences outside of the application including how they heard about Ask Izzy and if they had recommended it or supported others in using it. We also asked what they thought were the barriers to uptake. If they chose not to use Ask Izzy, we asked for the reason.

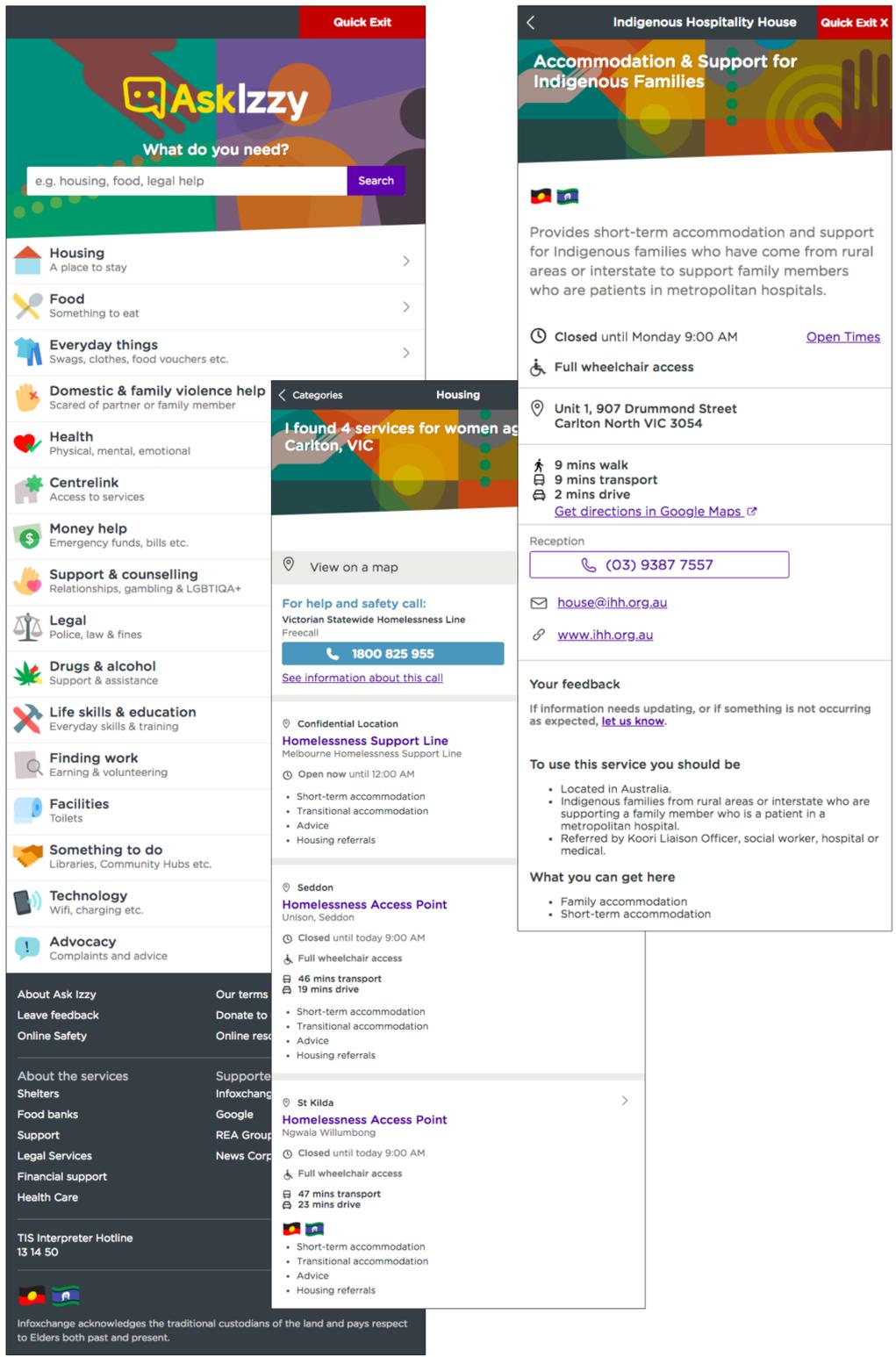


Figure 1: A sample of screenshots from the second release of Ask Izzy. Left to right: Landing page, service list page and detailed service page.

Table III: Interview Participants

Participant Groups	Number	Sample Coverage
Homeless and Ex-Homeless	14	Adult, Youth, Family Violence, Veteran, Mental or Emotional Difficulties, Drugs and Alcohol Problems, With Children Stable Living Conditions, Unstable Living Conditions
Service Providers	15	Official Service Providers including Government funded and Charities, inc. Services Providers for Aboriginal and Torres Strait Islanders
Software Owner	1	A representative from the software company

All transcripts and audio recordings were imported into the NVivo tool (Bazeley and Jackson (2013)). The results were analysed by two authors following a thematic data analysis process (Braun (2006)) in order to identify, analyse, and report the themes from the data. Codes (i.e. quotes) were extracted from the transcripts that were related to emotional experiences. The codes of the transcripts were grouped individually into themes and then later discussed and merged to form a final agreed set of themes.

Following guidelines for thematic analysis, no specific framework of emotions was used to categorise the elicited codes. Any text phrases that were thought of as representing the way the participant would or would not like to feel were marked and extracted. We retained information about the role of each participant in order to contrast views of service providers with those who are homeless or ex-homeless.

3 Results

The reaction to Ask Izzy was positive. Seven themes emerged that represented aspects of design that may act as barriers or enablers to the uptake and use of Ask Izzy.

More specifically, 107 codes were extracted from the transcripts and subsequently grouped into the 7 themes. These themes were Empowerment and Control, Assurance, Cared For, Identity and Belonging, Clarity, Unashamed / Without Stigma and Hopeful. We give a brief description of these themes in this section. Note that those who are homeless or at risk of being homeless are referred to as clients by the service providers.

Empowerment and Control: *The empowerment and control theme is about new ways clients can access service information.*

23 codes were extracted and categorised as being related to empowerment and feeling in control. This theme emerged from discussions about the visibility and ordering of services presented on the *service list* page. Ask Izzy provided new ways of accessing services that would not have previously been publicly available.

Assurance: *The theme of being assured is associated with the ways in which trusted information is accessed.*

16 quotes were categorised as being related to feeling assured in the information accessed through the application. This theme was associated with the person or organisation that provides information and the impact that has on confidence in that information.

Cared for: *The theme of feeling cared for was associated with both software features and related social interactions.*

Five codes were categorised and were related to clients feeling cared for when they were provided with useful information. They also discussed how they used Ask Izzy to care for others by accessing it on their behalf.

Identity and Belonging: *Signalling that services are inclusive gives rise to a sense of belonging.*

12 codes were extracted and categorised as being related to a sense of belonging and a sense of identity. This theme was mostly relevant to Aboriginal and Torres Strait Islander user group as they wished to feel that this software application had been designed with their needs in mind.

Clarity: *Clarity is a theme about presenting relevant information without being overwhelming.*

16 codes were extracted and categorised as being related to having clarity as opposed to overwhelming the user who may be stressed or emotionally unstable at that point in time. This theme was associated with a variety of sources relating to understanding the available service options.

Being Unashamed: *Being unashamed is a theme about avoiding the stigma that hinders help-seeking behaviour.*

13 codes were extracted and categorised as being related to the stigma associated with homelessness. Due to the stigma associated with being homeless, clients are apprehensive about asking for help. This theme emerged from discussions around alternative and anonymous means of accessing information.

Hopefulness: *Hopefulness is a theme associated with help-seeking behaviour while managing expectations.*

22 codes were categorised in the theme of hopefulness. Many participants

emphasised the balance in technology design about motivating user to find help while simultaneously managing user expectations.

4 Findings and Discussion

We now revisit our initial research question: *What are the needs of those experiencing homelessness that should be considered in the design of new technology?*

In the following we discuss the seven themes and contrast views of those who are homeless or ex-homeless with those who are service providers. These themes represent design considerations that were found to be positively addressed in the design. However, these themes still had the potential to become barriers to the uptake of Ask Izzy for a variety of reasons.

4.1 Empowerment and Control

The extent to which service providers and clients felt in control was influenced by the number and types of services that were listed in the *service list* page. Concretely, people who were homeless explained how the mobile web app frequently presented more service options than they were previously aware of and that the power to choose which one to access was in their hands.

“... you don’t have to go to that one, you can have a choice.”

Contrary to the views of clients, the service providers had a different stance. Ask Izzy would reduce the control that service providers had regarding the ways in which clients access the services. They were concerned that clients would accidentally be provided with inaccurate information while searching for services, and consequently end up approaching an organisation that was not able to help. One service provider stated:

“It’s worse knowing it’s there and that they’re not going to be able to help me. It would be better thinking there is only one service.”

This tension mirrors findings in related work (e.g. Weise et al. (2017)) that has documented the changing shift in power from governments and service providers to the public. What underlay this tension was the ability to access service providers via searching for their details online as opposed to a recommendation by an existing case worker or service provider. Consequently, the information that is presented in Ask Izzy came with a risk that a homeless person would attempt to access a service that was inappropriate to their situation. For example, one participant stated that information about service providers is sometimes only provided by a referral via another service provider. This prevents many people from even knowing that the service exists but gives the service provision network the control to only recommend this service to those that would qualify to receive it.

4.2 Assurance

Those who are experiencing homelessness trust recommendations from others in the same situation, and as such, trust is a vital mechanism of discovering new information. One person experiencing homelessness said:

“Word of mouth, word of mouth, whatever they hear on the streets. So they take their opinions and advice of people, other people that are homeless that have been there and know the system. Who’s who. [...] Because people don’t let you down, on that side of life.”

This illustrates the power of trusted information sharing within a community of people experiencing homelessness. The trust in whoever is recommending Ask Izzy, and also past experiences with services, are therefore transferred to trust in the application itself.

4.3 Cared for

While participants were reflecting on their interaction with Ask Izzy they described how the language that guided them to find their service was personable. Ask Izzy was created for the purpose of helping them and they consequently felt cared for. However, the extent to which a client felt cared for was dependent on the accumulated interactions with service providers, those others who recommend or who are accessible via Ask Izzy.

Another client explained how he frequently used Ask Izzy to help others:

“There’s a lot that have come up to me and go ‘we haven’t got smartphones but you’ve got your Ask Izzy’ [...] A lot of them come back and go oh that was very positive, where else can we go?’.”

This is an example where the subsequent interaction with the newly found service provider influences how much a particular client feels cared for. For this reason, the feeling of being *cared for* may change with each experience seeking help. In short, the design creates the expectation of feeling cared for and is therefore strongly influenced by the series of interactions with multiple service providers over what is likely to be numerous years.

This example also illustrates an interaction with Ask Izzy is not necessarily one person with a mobile device who is helping (caring for) another to find what they need. This interaction was not the primary way that designers envisaged Ask Izzy to be used, however, our findings indicate that many interactions with Ask Izzy are social. They may be between two people that are currently homeless where one is an expert user. Other engagements involved a service provider finding details on behalf of a client.

4.4 Identity and Belonging

This theme was mostly relevant to Aboriginal and Torres Strait Islander user group as they wished to feel that this software application had been designed with their needs in mind. This was a challenge as the interface design preferences from different cohorts of users were very different. The Aboriginal and Torres Strait Islander communities wanted the design to show a signal that their needs had been considered, and to connect them culturally to their community.

They initially described Ask Izzy as “*too mainstream, too governmental, whichever way you want to put it.*”. This negative perception was generally related to the aspect of the design that was “*lacking*” as opposed to one that already existed. The feedback became a high priority requirement for future iterations of design to see how the need of identity and belonging could be better addressed.

One representative of the software development team said:

“How do you take something that a lot of people like at the moment and then come up with a next generation and then make sure that the things people like are still there [...] That’s a really interesting design challenge.”

4.5 Clarity

Ask Izzy was deliberately designed to communicate the thousands of services as clearly as possible. One participant who had experienced homelessness said:

“Your emotions are high and all that sort of stuff you’re going through with something you’ve never experienced in your life before. So from that point of view it’s absolutely brilliant, ’cause it tells you, you open it up, and it literally tells you which tram to get onto and which stop to get off and which train and all that sort of and so on.”

The simplicity of the categories, imagery, icons and language was designed with clarity in mind. When in stressful situations, some clients rely on recommendations from service providers or their case worker to be able to use the application, “*I just talk to my case worker because they have all this information,...*”. In these scenarios, Ask Izzy would potentially be used by both clients and service providers together. One service provider explained how they had a link to Ask Izzy on their desktop.

A second sub-theme related to clarity is about the clarity of the purpose of who Ask Izzy was for. Many target users of Ask Izzy do not identify with being homeless. Rough sleeping is heavily stigmatised. Those that have stabilised their living situations are quick to reject the characterisation of their situation of homeless.

One service provider stated:

“So that’s part of the problem with promoting things as homelessness is most people don’t identify.”

4.6 Being Unashamed

Due to the stigma attached with asking for help, many people who were homeless preferred to access information anonymously through sites like Ask Izzy, or alternatively by creating a fake profile on social media.

One client stated:

“Well I find Facebook easier [than speaking in person] because I can be anonymous on Facebook so like I can make up a fake profile and just ask random questions on a group and they can like reply, so it’s sort of like word of mouth but it’s like word of mouth I don’t have to [be there in person]”

The increasing desire to seek help online was also documented in prior work by Woelfer and Hendry (2012). While there is existing evidence to show that information about services is complex and overwhelming, there is also a growing body of work to show that this means of accessing information is convenient and in the example above, preferred.

4.7 Hopefulness

The use of Ask Izzy becomes a trigger where the hope is created, it then may be acted upon by approaching a service. The amount of hope that a user may feel changes with each subsequent interaction with the app and also service providers. The reality is that the journey to a stable living situation may be a number of years. The greater the initial hope, the greater the risk of negative consequences in the long-term when expectations are potentially not met.

In our interviews, service providers explained how the application needs to set realistic expectations:

“It’s not a silver bullet in that sense, so I think that, it connects people to information quickly which is really good. But it doesn’t necessarily resolve what they need.”

Feelings of hope on part of the clients were increased with any indication that they may have found a solution to their problems. Too much hope comes with the danger of disappointment when the actual service fails to meet a user’s expectations in reality. Too little hope may be caused by explaining the harsh reality of what to expect from under-funded services, and therefore may discourage clients from seeking and/or engaging in social networking services in the first place. Framing the right message to manage client expectations is a challenge here and can sway clients to take action and access services or not. Many clients could recall an instance where they were devastated after a particular service could not help them.

4.8 Limitations

There are some limitations that we took steps to mitigate. Firstly, the thematic analysis comes with the inherent characteristic of those themes being open to a subjective interpretation by coders. To reduce the risk we followed recommended steps of comparing and merging results with more than one coder. Secondly, the results are only for one case study and therefore they may not be representative of other new technology for homelessness. We are therefore cautious with the generalisability of these results as the capability to appropriate technology similar to Ask Izzy is likely to be dependent on multiple societal factors, such as familiarity with and appropriation of e-government services. Despite this, the investigation was grounded in a large industrial case study that aimed to help those who are homeless with a diverse range of everyday needs.

5 Conclusion

People who are homeless are now increasingly tech-savvy and use the internet to find information and ask questions anonymously. We evaluate an existing mobile web app to better understand the technology needs of those experiencing homelessness. We firstly conduct semi-structured interviews with 30 people who were either homeless, ex-homeless, a service provider or a software company. Seven themes emerged from the analysis that would be useful considerations for the design of technology for those experiencing homelessness. These were: empowerment and control, hopefulness, assurance, cared for, identify and belonging, clarity and being unashamed.

During the thematic analysis, we found our focus on emotion useful to gain a shortcut to important contextual information uncovering barriers or enablers to the use of similar technology. In some cases our results confirm and elaborate on design challenges that have been articulated elsewhere in related work. For instance, access to new information via Ask Izzy is empowering for those who are homeless. Also, the need for clarity is important, especially with those who are younger as they can be easily overwhelmed by the amount of information available and the complexities of navigating the service provision network. Our evaluation also offers multiple new insights; many uses of Ask Izzy were *social*. Users with smartphones frequently accessed Ask Izzy on behalf of others who were homeless without a smartphone. Ask Izzy was also used by service providers who used it as a reference point on behalf of those asking a question in-person.

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