

Building Connections: Technology Design for Living on a Low Income

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ABSTRACT

This paper presents an exploration through participatory design in supporting those living on a low income. We share our findings from a workshop with users of an Australian non-profit organisation involved with food relief. This process of co-creation with disadvantaged participants led to ideas for technologies to assist those rebuilding after a crisis; namely the ideas of a time-stamped public transport card and a “crisis phone”. Finally, we reflect on our design process to date with some considerations for future designs. For example, how we found that the informal conversations and diversions from the content of the workshop served to define the problem space better than activities that had been specifically planned for this purpose.

CCS Concepts

- Interaction design process and methods → Participatory design
- HCI design and evaluation methods → User studies

Keywords

Low income; Food relief; Welfare; workshop; finances

1. INTRODUCTION

Australia is one of the most expensive countries to live in the world. However, despite provision for social welfare and a relatively high average wage, homelessness, poverty and income inequality remain major problems for Australian social services and policymakers alike [1]. Low income represents more than a monetary problem, extending to social inclusion, well-being, health and access to technology [7]. While ubiquitous computing technology continues to transform the information landscape, vulnerable groups such as those without stable income or shelter are the least likely to have access to this technology which is increasingly required to mediate access to many vital services and opportunities [7]. This general dilemma is summarised by Le Dantec: *“In everything from maintaining social connections... to finding and applying for employment and housing, the presence and necessity of interacting with technology has real consequences- and opportunities- for the urban homeless”*[7].

Technology offers opportunities for empowering disadvantaged

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individuals and communities [3], [5], [6], [9]]. Le Dantec et al. [7] report on their deployment of a messaging system used to connect residents and staff of a shelter for homeless mothers and discuss the ongoing use and utility the system provided. Kwon and van Boeijen [5] share their journey toward co-designing an SMS service for the homeless population in London. However, the power of technology as an agent for empowerment is contingent on the technology fitting the network of relations into which it enters [10]. Burrell [3] cautions against viewing technological initiatives as the sole agent for empowerment and ignoring more complex social, cultural and political factors.

Owing to its political origins and central tenants of democracy and representation, researchers in the field of Participatory Design (PD) have investigated the contexts of inequality and disadvantage [2], [5], [8]. PD research in this space includes leveraging technology to disadvantaged populations [2] and community support services such as community groups and non-profit organisations (NPO's) [8]. PD gives equal weight to issues of organisation and participation, as to the design of the technology itself. This includes building conditions suitable for participation early in the design process [4]; managing the tensions of extra time taken in design versus the pragmatic need for rapid design development; and the importance of ensuring legacy and ownership of produced designs [8]. When working with disadvantaged groups or NPO's, a challenge for designers is how to empower the community group to design and maintain the technology themselves, rather than acting as a short term consultant.

We now detail our experiences using a participatory approach to designing technology aimed at living on a low income. After an overview of our previous efforts, we concentrate on a group workshop with recipients of a food-relief program run by a local NPO and close with some reflections on our design process and how our understanding of the problem space has evolved.

2. BACKGROUND

Rather than viewing low income as a problem or ‘condition’, our intention was to eschew a deficit model approach and instead understand the various and innovative ways in which people get by and even save money despite a low income. In a series of initial interviews, we had explored how families budgeted their money, saved money, and how they envisioned technology that might help support these endeavours. Interview participants were then invited to imagine and describe (or draw) their ideas for an “ideal” technology that would help them budget or save their money. While technology may not always be a priority for those living on a low income, in Australia the mobile phone is endemic and it was felt that technology might well have a role to play in connecting people getting by on less.

We found that getting by on a low income involved a wide range of innovative and sociable practices, including sharing and pooling resources, bartering and use of available support services. Participants were mostly adept at budgeting money

and the social processes involved with getting by on less actually had little to do with tables or spreadsheets. The importance of social connections in managing money illustrated to us the need to look beyond money itself. As such, we pursued a better understanding of the social contexts of low income prior to designing technology to assist people with their finances. The creativity of responses to the question of an “ideal” budgeting technology outlined to us the potential to develop these ideas further and include our participants further in the design process. We determined a more forum-based approach would be ideal for developing these ideas further.

2.1 The Pantry

We engaged with a local Brisbane-based NPO called Community Qld (hereafter ‘Community’) and made regular visits to their twice-weekly food relief program “The Pantry” over several weeks. The aim of these visits was to observe the function and rituals associated with the provision of the food relief and chat informally to users who had a story to share. As per [5] we wished to build a level of rapport with users and staff, i.e. attempt to build “conditions for participation” [4] prior to the workshop itself.

The Pantry was available to anyone who felt they required it and a typical week comprised a small number of regulars and a larger number of people accessing the service in a time of crisis. A long table was provided so that users could have a cup of coffee and chat to others while they waited. The process of the food relief and the work of the Community is explained in more detail in [11]. Informal conversations with users revealed a number of motivations for accessing the food relief. Users variously described their situations as lacking a fixed address, owning a home, unemployed, casually employed, recently out of jail and seeking asylum in Australia. Quite aside from the window that these conversations provided into the everyday lives of the users and their motivations for accessing the Pantry, we believe these visits were a necessary pre-cursor to the workshop; leading to a level of a shared understanding of each other and establishing conditions suitable for further participation.

2.2 The Workshop

In hoping to share and further develop the ideas gathered during the interviews and food-relief visits we collaborated with Community in organising a large workshop on the theme of Getting by and Living on Less. Our goal was to entice participants to (1) develop a shared understanding of the problem space and (2) encourage participants to imagine novel design possibilities beyond their immediate experiences and constraints. As we intended to maximise the sharing of ideas between groups and possible adaptations, we asked representatives from each group to present their group’s design idea to the workshop, with others able to ask questions and make suggestions and improvements on the design.



Figure 1: The workshop prior to group formation.

The workshop (Figure 1, above) was attended by 18 users of the Pantry and a resident social worker. All participants received a \$30 supermarket gift card for their participation. Two of the 18 participants had taken part in our earlier qualitative interviews and we had spoken to more than half during our visits to the

Pantry in the previous weeks. The workshop comprised four activities:

(1) Getting by on a low income: All participants wrote on post-it notes five answers to each of the following: On your present income, how do you: (a) eat healthy (b) stay fit or active (c) have fun (d) What stops you from doing any of the above? Responses were collected and arranged on a whiteboard under their categories. Our aim was that the anonymity of writing answers on post-it notes would encourage honesty and participation. The discussion of the responses that followed represented a chance for participants to share their own experiences with the group and to build a shared understanding of the different constraints and opportunities of the problem space of getting by on less.

(2) Design an induction booklet: After forming groups of four people, each group generated ideas for what content should be included in a pamphlet to be given to all new Community users. Finished products typically consisted of mind-maps drawn on butcher’s paper. At the completion of the activity, each group presented their ideas to the workshop. Our intention was to give participants a relatively structured design task (in contrast to Activity 4) in order to get them accustomed to working in their group and ideating novel designs.

(3) Four ideas for assistive technology: Next, we circulated cardboard mounted images of potential design concepts we considered might be helpful to save money and organise finances. The ideas (and their origins) are described below:



Figure 2. Design concepts shown to the participants.

1. *The \$561-per fortnight thermometer:* A simple smartphone app that visualises the amount of money left before the next Newstart [welfare] payment of \$561. An easy glance-able reference that does not require login to internet banking. This idea was an “ideal” technology sketched out in an interview.
2. *The Pantry’s coffee table on your phone or PC:* An app where the pamphlets and information on the Pantry’s coffee table is replicated in digital format, and can be accessed anywhere.
3. *Smart Piggy:* A concept outlined in [9] where a physical piggybank calculates the amount of money deposited in it and provides the user with a digital display of the current balance.
4. *The “only with a can opener” money tin:* This was an artefact used by one interview participant. The difficulty of accessing the money inside helps controls spending.

(4) Design your own assistive technology: Using the previous exercise as inspiration, participants in their groups were asked to design their own assistive technology. While the workshop was limited to pens and drawing on butchers paper, the objective was to ideate, and map out an idea for a technology that would assist them in the context of managing finances. We encouraged all groups to think far beyond current technology, monetary and engineering constraints.

One researcher facilitated the workshop while another worked with different groups and answering questions. We had shared our plans for the workshop with Community prior, with respect

to the literacy of their client base. Informal conversations punctuated the workshop- many were allowed to run their course, however the facilitator did move things along at times to ensure a timely finish. The workshop was audio recorded and all resulting artefacts were photographed. The audio recordings were transcribed verbatim with the resultant transcripts manually coded for emergent themes alongside discussion of the finished products.

3. WORKSHOP FINDINGS

The following represents a short overview of some of the themes that resulted from the workshop.

3.1 Making connections

Connections emerged and remained one of the strongest themes throughout the workshop. In particular connections emerged between people who find themselves in a crisis and avenues of support. It was felt that while there were services, agencies and charities capable of providing support to people in need, fundamentally, one had to be able to find and access these services in the first place. This extended even to Community itself: *"If I didn't live almost next door I wouldn't have any idea"*.

Activity 4 of our participatory workshop yielded several design ideas that were co-developed from our participants' personal experiences of these feelings of disconnect. A common theme across these ideas was the difficult, yet vital task of connecting or reconnecting with avenues of support in a time of crisis.

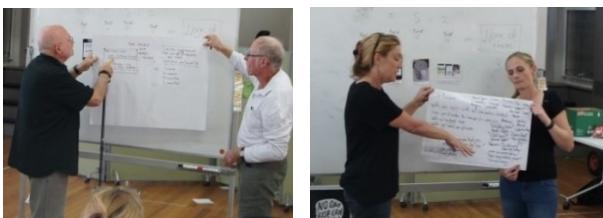


Figure 3a and 3b. Design Ideas

Figure 3, depicts two groups demonstrating their ideas towards activity 4. Figure 3a (left) shows one group's design idea of a time-driven 'smart' public transport card doubling as a phone-card that would provide free travel and phone calls for a limited time, rather than a limited dollar value. *"They don't put money on the card, they put time on the card... so if you're in a desperate situation you can use it for whatever time you need it"*. The card is issued for a limited time, long enough for its user to connect with the necessary service providers and become more stable. This group explained that in a time of crisis, travel and phone credit were fundamental to getting back on one's feet.

Figure 3b (right) shows another group's design idea called 'Crisis Phone', linking the user to free public and not-for-profit services relevant to people facing crisis situations. The idea is for the user to input a postcode to find out all the free services available around the locality. The group described how difficult it was to find the right information from multiple sources and how important real human contact in these situations was: *"The most important thing here is that you should be able to talk to a real person"*. Participants also noted the acute isolation felt in a time of crisis, and how the Crisis Phone could address this: *"This [crisis phone] is something that connects you to the society. 'Cos when you're homeless, or leave domestic violence, or just came out of a jail, you don't have any connection what so ever."*

Notably, in both these designs was the implicit suggestion that the funding and infrastructure would be available to support and distribute these technologies. One group member mentioned the need for those coming out of jail to be provided with a smart phone, for their Crisis Phone system to work.

3.2 Collaborative knowledge

A multitude of ideas were shared throughout the workshop concerning how to get by on less. Presentation of group work during activities 2 and 4 at times diverted into a more conversational sharing of collective knowledge regarding different support services, free food and good shop and thrift shops. Particularly during activity 2, participants presenting their group's work were often interrupted and asked questions about the specifics of a service or for more information:

A: ...they've got a soup kitchen and clothing for free. I go for the clothes side of it...."

B: [Interrupts] Where is it?

A: [name of road]

B: What time? We should put the time down!

Participants shared their own knowledge and questioned others on their experiences of the same service. This discussion moved away from making connections in a time of crisis towards general tips for saving money. This highlighted to us the importance of appreciating the uniquely different design requirements of people undergoing a sudden change (i.e. crisis) or an incremental change (i.e. in a stable situation, but still struggling to get by financially).

4. REFLECTIONS & NEW DIRECTIONS

So far we have described our participatory approach toward designing technology aimed at getting by on less. We have attempted to include those potentially affected by our future designs as early as possible. We close by sharing some reflections on tensions in our design process and future steps in this design process.

Workshop reflections; priming design: We experienced a tension when designing the workshop between wanting opinions and discussion on the four prototypes we had gathered (activity 3) and not wanting to 'prime' or influence participants' own blue-sky designs in activity 4. On reflection however, we believe the priming was valuable and did not bias or seed designs. Groups were more motivated, worked better during activity 4 than activity 2 and produced innovative designs which did not resemble any of the prototypes shown. Research shows that providing only one example is problematic as it can lead to mental blocks, but providing more can be inspirational [6]. Our workshop included some individuals with little or no experience of being participated in this manner. Although each context requires its own consideration of whether to prime or not, in this specific context we are happy with our decision.

On reflection, one aspect of the workshop we would have changed was the choice of writing tasks. Despite having consulted Community with our workshop plan prior and despite the fact that all participants completed activity 1 without obvious concern, it is possible some participants may have felt less comfortable writing than others. In our future work we will think carefully in our choice of methods with regard to user literacy and ability.

Transcending money, transcending technology: Initially the focus of this study was on technology to support people to manage their money. However, over the course of this process we now understand the problem (and thus the direction of our future work) to be less about actual money management (i.e. [9]) and more about making connections with people and with goods and services. Participants left our workshop with notes and connections to follow up with- i.e. tangible useful information. It is this unifying of people and sharing of information in the moment, regardless of any final design outcome, that we believe is indicative of the contribution of participatory design in this process. Consideration is important for how best to

encourage these informal conversations and connections, which at the time may appear to be diversions, but what several participants described to us afterwards as being the most important outcomes of the whole workshop.

Broader concerns for future work in this context: People who access food relief represent an incredibly heterogeneous cohort, from skilled professionals out of a job to complex issues of homelessness and mental illness. We consider one of the biggest distinctions to be mindful of in these contexts, is that between those in an immediate crisis and those who are stable, but still struggle to get by on a low income. Designs that may be suitable for those in a crisis may not be suitable for those who have already found housing and accessed services. This distinction, while implied in [7] is not yet widely salient in the design literature to date. Many people in the situation of requiring food relief are under great stress. Design itself, if poorly done, may increase this stress or worsen their situation. For example, if the Crisis Phone is pursued, something as simple as an out-dated address for a government agency could cost the time and expense of a trip across a city with poor or infrequent public transport connections. Equitability of access and usability are fundamental considerations when designing for disadvantaged populations [7]. Correspondingly, we aim to be careful with our future designs in this space and ensure that any design, if it fails or malfunctions does not leave anyone worse off or under stress.

A challenge in our future work is supporting the processes of building connections and re-building lost ones. The designs ideated and developed by the groups in our workshop provide a compelling starting point towards this. Owing to the nature of the designs produced and the importance of distinguishing between people in crisis, versus those re-building post-crisis, our next challenge is better understanding the needs of those facing immediate crisis. Wishing to ultimately design and prototyping a technology akin to the Crisis Phone, we plan to first map out the journeys of those, for example, leaving jail, their information needs and the services they access. The focus here would be on gathering retrospectives from those who have made such a journey in the recent past and have become stable (rather than those in the midst of such a transition) and those who are eager and able to discuss their experiences. While careful selection of participants is a critical factor here and would involve the participation of social workers, we were struck in the workshop by the openness and eagerness of some participants to share their experiences of difficult times. Following this, we hope to begin a series of prototypes. Because we anticipate the Crisis Phone may be used in yet unexpected ways, and noting that the purpose of a new technology is defined by its use [4], we are conscious of balancing further problem definition work (i.e. mapping out the immediate journey out of jail) with getting "stuck in" and developing prototypes. A consideration here is that of [8]: how best to work with Community and their users such that we are not just another consultant who deploys a technology and disappears, leaving behind a community group who has little expertise or resources for further developing it or fixing it.

5. CONCLUSIONS AND SUMMARY

As well as sharing findings and reflections from a workshop, this paper documents our process of reconceptualising the broader problem of how to support people to (re)build the connections that enable them to live well on less and get by in crises. We close by revisiting our main findings and considera-

tions for future work. We found that building connections to people and services is a fundamental component of getting by on a low income. Informal diversions, conversations and sharing of knowledge during workshops can define the problem space better than activities planned specifically for this purpose. Users of food aid are highly diverse and understanding this is critical. For example, designs that are suitable for those in a crisis may not be suitable for those who have already found housing but still struggle with income. Further work would be helpful mapping out the journeys of those in crisis and where and when in these journeys can designs such as the Time-Stamped Public Transport Card and Crisis Phone best support people.

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