Questionable Concepts: Critique as a Resource for Designing with Eighty Somethings

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ABSTRACT

This paper reports findings from a series of participatory design workshops with ten people over eighty years old. The focus of the workshops was new banking technologies for the older old. Participants were asked to discuss their current experiences of banking and given packs of *concept cards* which contained design sketches and brief outlines of concepts for new financial services. The designs on the cards were deliberately provocative and aimed to encourage criticism and debate. Participants wrote and drew on the cards and the workshops were recorded and transcribed. The participants were extremely critical of current banking practices and most of the new concepts we presented to them. Their questions and comments led to a number of insights and further iterations. The paper argues that critique is an essential resource for design, both in terms of identifying problems and iterating ideas.

Author Keywords

Ageing, Eighty Somethings, Banking, Participatory Design, User Study Methods.

ACM Classification Keywords

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

General Terms

Design.

INTRODUCTION

Much of the industrialised world is in economic turmoil. Nations such as Greece, Portugal, Spain, Italy, and the United Kingdom are going through periods of 'austerity' [5]. Public and personal debt appears to be the norm and those people who have saved money responsibly during their lives are punished as the interest rates provided by banks dip below those of inflation [31]. This paper focuses on the banking experiences of people aged over 80 in the United Kingdom, a group who are exceptional having already lived through periods of far greater austerity than we are currently experiencing.

People over 80 are often referred to as 'older old' [12] but we prefer to use a more neutral term: *eighty somethings*. Eighty somethings are the largest growing age group in the world and there are now more eighty somethings alive than ever before [12]. Despite this, the banking sector does not provide services that are either appropriate for this age group [20] or make use of their lifetime of banking experience. There is currently considerable interest from the banking sector in new digital payment systems; contactless Near Field Communication (NFC) technologies mean payments can be made with the wave of a phone, whilst new 'apps' allow people to transfer funds at the swipe of a finger [e.g. 38]. The pace of development in the digital payment arena has been such that in the UK it is suggested banknotes and coins will be redundant by 2050 [34]. Whilst new technologies appear to be supporting novel ways of spending money, very little appears to be available to help people manage their finances in a period of great need.

Prior to the work described in this paper we identified a number of themes that were important in the 'financial biographies' of 12 eighty somethings collected through in-depth interviews [35]. We observed intricately kept paper records, which helped the eighty somethings to control how much they spent and how much they saved. We also noted that most of their financial transactions were performed with cheques, banknotes and coins. For many this led to situations where impaired mobility meant they could no longer access their money. This sometimes led to situations where the eighty somethings shared their security information (e.g. pin numbers) with family and carers.

We sought to ensure that our previous ethnographic work was critically reflected upon and integrated into the design process—a phase of design that is often problematic [13]. We aimed to encourage the participants to be critical of our ideas and come up with better ones. As a way of encouraging the eighty somethings to become active participants in our design process we developed concept cards to illustrate our ideas and capture their responses. The findings from this study make three contributions to the Human Computer Interaction (HCI) community. First, we

unravel some of the reasons why eighty somethings are highly critical of current banking trends and the role of computers in particular. Second, we find that using questionable concepts to encourage critique not only provides insights into current practices but also inspires creative responses in the form of new design ideas. Third, questionable concept cards provide an example of how design relevant data and ideas from workshops can be captured and used in an iterative design process.

BACKGROUND

A large amount of past HCI research has explored how digital systems may be better designed for older people [e.g. 16]. However, this age group remains relatively disinterested in new technology [10]. It is still very unusual for an eighty year old to actively participate in digital communities. In the UK 80% of people aged 75 and over have no access to the internet from their homes, and 50% cannot see any value in having it installed [28]. In the context of financial services, even those older people interested in Internet banking are hesitant about using it. Often, concerns over the security of financial and personal data are cited as a reason for not using Internet [25] and mobile banking [23] and younger people are far more willing to trust online payment systems than older people [32].

It is well documented that the needs of older people have rarely been considered as the banking sector has moved towards electronic and digital payment systems and away from traditional methods such as cheques and cash [36, 39]. In our previous work we noted that digital banking often requires the use of Personal Identification Numbers (PINs) and passwords that are difficult to use and remember [35]. It was not unusual to find situations where people shared their PINs with others to continue accessing their finances [35]. Furthermore, whilst many older people rely on banking facilities in their local communities [39] these are under continual threat of closure in the UK [30].

In this paper we describe participatory design workshops with new groups of eighty somethings that occurred six months after the contextual work. As a way of linking these phases and different cohorts together we developed a series of 'concept cards' based on our initial study. In the following sections we describe how and why these concepts and cards were developed. Not only did the use of questionable concepts invoke critique from these new eighty somethings they also informed an iterative design process eventually leading to the development of high-fidelity prototypes (described in detail in [37]).

QUESTIONABLE CONCEPT CARDS

There is a long tradition in design of making provocative proposals and objects. Jaques Carelman's "objets introuvables" or unfindable objects include the teapot with the handle on the same side as the spout which has illustrated the front cover of many editions of Don

Norman's Psychology of Everyday Things. Carelman's Catalogue of Extraordinary Objects [8] includes a bicycle seat that has a toilet in it, and a rifle with five barrels for a one man siege.
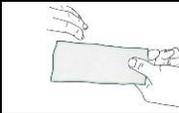
TITLE	ILLUSTRATION	DESCRIPTION
Exploding Handbag		A handbag that lets off a paint bomb when stolen.
Cashier TV		A direct video link to the bank so you can see delegated transactions being completed.
Disappearing Money		Intelligent banknotes that disappear when handled by an unauthorized person.
Mobile Bank		Pay bills, make deposits and withdraw cash at your front door.
Money Club		A social lending club for sharing and investing money and inter-generational money advice.
One Time Card		A recyclable card that can be shared and only used once.
Pin Thimble		PIN displayed when placed on finger tip.
Shared Card		A locked bank card that can be unlocked and shared for one transaction.
Smart Wallet		An intelligent wallet that displays your incomings and outgoings.
TopUp Debit Cards		Individual cards for payees that can be topped up and easily controlled.
Video Banking		A video link to a local branch to talk face-to-face.

Table 1. Questionable concepts, illustration and description.

Such fantastical objects are also produced by enthusiasts of Chindogu [21]. Whereas many of Carelman's designs are unusable, Chindogu objects are "un-useless" in that they solve one problem but create some other larger problem. For instance the Portable Lamp Post [21] by Kawakami is not useless because it brings light to dark streets but it is not useful because it requires the user to wheel a street lamp around with them: it is un-useless. Such extraordinary

objects and un-useless designs are often used when teaching abstract notions like usability and affordances. They have also been used to discuss design spaces [e.g. 6]. Following the financial biographies with eighty somethings and their carers [35] a number of concept designs were developed during a workshop including researchers, designers, care givers, banking experts and representatives of age related charities. Workshop participants were given cards containing detailed quotes from the ethnography and asked to group related quotes together. Following this there was a phase of quick ideation that related back to the quotation groupings. Therefore the concepts generated were not conceived to be entirely frivolous but neither were they thought of as in any way finished or likely solutions to the problems they sought to address. These ideas were cross-compared by the lead author and ideas that were similar to one another were combined. The eleven resulting ideas were visually developed into graphical concepts to seed our participatory design workshops with a further cohort of eighty somethings (see Table 1).

Bardzell and Bardzell's work on the design of sex toys [1] highlighted the role that criticism plays in motivating design. The toys already on the market were considered by the designers interviewed to be lacking in various ways – the materials were cheap, the motors were noisy, they were smelly. This critical stance not only helped to identify product needs but also to motivate design innovation. We also wanted to use critique in this creative sense, as a resource for designing with a user group who are often said to be critical of any new technology [10]. Critique of the banking industry and banking products was often spontaneous during the "financial biography" interviews in the first stage of the research [35]. It was important that this spirit of critique also applied to the participatory design process. In order to avoid polite agreement with our suggestions we included very outré and silly concepts (for example an exploding handbag to deter thieves). Other ideas, such as the 'Pin Thimble', 'Money Club' and 'Mobile Bank' were felt to have more immediate worth. Even these more sensible ideas however were felt provocative and questionable due to their impracticality.

We were also aware that the concepts might be found questionable by our new participants due to them being conceived in response to the original cohort. This was a conscious decision as it was felt such reactions would be useful in providing a rich understanding of the heterogeneity of these different groups of eighty somethings. We also did not wish to offend or disrespect our participants and wanted to indicate that even the more outrageous ideas were highlighting problems we found in our previous work. Therefore each concept was linked to quotes from our contextual research [35]. In the case of the exploding handbag the illustrated concept was accompanied by a quote from a participant in the previous study whose handbag had been snatched in the street.

Some of the designs were left deliberately opaque and ambiguous. There was for instance very little explanation as to how 'Disappearing Money' might be used. Following Gaver et al. [14] it was hoped that this ambiguity might create a resource for the participants to respond to. Some of the suggestions were also deliberately playful and provocative, most obviously, the 'Exploding Handbag'. Although the designs suggested were un-useless or at least questionable, the problems they sought to address were real. The workshop discussions were not limited to the concepts and frequently an idea (e.g. the van bringing cash to the door) prompted wider discussions of current banking practice and security. These were also encouraged so that critiques on current banking practices and what imagined futures might look and feel like were interwoven with one another. Further questionable concepts were developed and sent to participants following each workshop (see Table 2 and Method) based upon the discussions and ides they had.
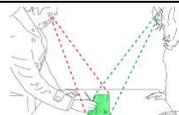
TITLE	ILLUSTRATION	DESCRIPTION
Contact Cards		Bankcards that are physically stamped when paying bills or withdrawing money.
DNA Banking		Paying bills and withdrawing money with unique DNA.
Fingerprint Cards		Money that is spent when two people touch a card at the same time.
Flexible Banknote		An intelligent banknote that can be used to spend specific amounts at a time.
Iris Cheques		"Cheques" that become activated when two people are looking at them being written out.

Table 2. Questionable concept cards sent after first workshop.

Previous work in HCI has demonstrated that card-based activities are a useful way of capturing and communicating contextual and technological possibilities in workshop settings [19, 24]. We therefore developed the concepts into A6 sized folded cards with four sides (Figure 1). On the front of each card was an illustration of the design idea, such as the Pin Thimble (which upon recognising the users' fingerprint provides a pin number). On the inside of the front there was a brief description of the idea illustrated on the cover ("reminds you of your PIN when you need it"). Alongside this description we provided three to four anonymous quotations from the ethnography that had prompted the idea (e.g. "I have it [written] down somewhere, but they always say not to, I couldn't remember it with never using it" and "I ought not to [write

down this password] but I do...”). Our cards can be considered as abstracts of specific areas of our project, summarised visually and textually.

Figure 1. A collection of '*concept cards'*.

Unlike 'Speed Dating' [11] the cards provided a medium where the participants could reflect on the design ideas at home and potentially in contexts relevant to the issues described. Unlike cultural probes [15] the cards were not intended to provide returns of uncertain fragments of user data. Rather, the cards were intended to communicate to participants several design spaces that were not fully defined and open for them to manipulate and change. We were conscious, however, that not all participants would be willing to actively take the role of 'designers'. Accounting for this the cards also listed three questions that could either be responded to in text or illustration. The first and second were open questions about experiences they might have had related to the design space (e.g. "What are your experiences of PINs and passwords?"). The third question, on the rear of the card, asked them to imagine a future scenario and for them to draw something they would use in it ("Imagine an object that reminds you of passwords and codes ... what would it look like?").

Over the 11 cards there were thirty questions in total. The intention behind the pack of cards was that participants need not answer all the questions—rather, they would be asked to answer those that they felt were most pertinent and interesting. Very few of the questions were left completely unanswered, and the quality of the responses received went far beyond typical responses to written questionnaires.

METHOD
Participants, workshops and introducing the cards
Due to project and geographical constraints the design phase of our project was performed with different participants to the previous contextual work. The first study involved in depth interviews carried out for the most part in participants' own homes [35]. The participants discussed in this paper attended participatory design workshops involving groups. The need to bring a group together in one setting influenced the recruitment of a more mobile group of eighty somethings. The participants in the workshops were 10 females aged between 80 and 87 years, spread over three groups. These participants were recruited from a longitudinal study that investigated the psychology of ageing and technology use. The study had been running for 28 years and many of those who began it had died. These

then were somewhat unusual eighty somethings in that they were well used to university settings and research projects. The first group had 6 participants. The second and third workshops had 2 each. Each participant was paid £20 for taking part. Whilst we had not set out to recruit only female participants, this was illustrative of the make-up of eighty somethings remaining in the longitudinal and that women are still far more likely to live beyond 80 years than men [33].

As has been observed elsewhere, older people are not a homogenous group [27] and working with new participants emphasised this. All of the participants except one in the first study described themselves as working class. The participants of this study described themselves as middle class. Not only were their significant demographic differences between the two groups there were also marked physical differences. Many of the participants in the first group had severely limited mobility. All of the participants of the second study were physically fit and mobile enough to climb the two flights of steps that led to the room where the design workshops were held. The materials for the workshop were created with the first group of participants in mind and often illustrated with quotations from these interviews. The workshop participants were on the whole financially better off and physically fitter than the original participants. Therefore participant quotes on the concept cards were sometimes met with surprise and bewilderment. The differences in financial and physical circumstances between the groups led to richer discussions than we might have had with a narrower range of people.

Following a pattern set by the otherwise unrelated longitudinal study the workshops were characterised as "tea parties". During the break, tea, cake and fruit were served. In our first meeting with the participants we spent the first hour familiarising ourselves with each other. The participants were asked to introduce themselves and talk about who they banked with and how they felt banking had changed throughout their lives. The researchers joined in with this process, which allowed the participants to ask questions about the (younger) researchers' experiences and habits. This helped establish equality and a critical edge as the eighty somethings were scandalised by some of the young researchers' financial habits (e.g. credit card debt). It should be stressed however that the tone was friendly and playful throughout.

Each group attended two workshops with a two week interval in between. Near the end of the first meeting we introduced the concept cards to the participants. We explained that each card explained an idea that related to experiences other eighty somethings had talked to us about. They were informed that there were 10 cards in each pack with questions inside—but they need not go through and answer them all, just those that they felt strongest about. We also provided two envelopes for them to bring them

back in—one envelope for their favourite three cards, and one for the remaining cards.

During the intervening two weeks the design team worked on new cards based upon some of the ideas and discussions we had in the first meeting (see Table 2). This was to emphasise that we were listening to their discussions and developing new ideas as a consequence. These cards were sent out to the participants at approximately the halfway point between the two workshops.

Response and analysis
All of the data from the cards and the discussions were transcribed and the drawings and annotations made by the participants were scanned. We documented which three ideas the participants placed in their 'favourites' envelope.

The qualitative data from the transcripts and cards were analysed through a grounded theory methodology [9, 17]. The card and transcript data were summarised with open codes line by line. The open codes were brought together to form axial codes that described three overriding themes. Connections between these three themes were the basis of the grounded theory, which is a broad and reflective description rather than a predictive model [9]. The initial results and the detailed grounded analysis are described in the following sections.

RESULTS
The cards provoked a number of diverse responses from the eighty somethings. Nine of the ten participants selected their favourite three cards; one did not. Doris responded "*I was impatient with the whole lot, I couldn't really see much point in any of them.*" On the front of her envelope she wrote: *could not identify three favourites*. Similarly, Rita commented: "*These are not favourite ideas, just the ones I think may be the best.*" Ruth, on the other hand, liked a number of the ideas. She was particularly excited by two of the cards that were sent to her during the time between the workshops. These cards—'Iris Cheques' and 'DNA Banking'—were based upon ideas she had suggested at the first workshop, so perhaps it is no surprise she liked them.

Before taking the cards away there was some trepidation from the participants about how they should treat the cards: "*why would I want to scribble over your lovely cards?*" (Agnes). At the second workshop it was clear that most of the participants had engaged with cards in very different ways. Many of the participants were reluctant to do any sketching or drawing, e.g. Agatha: "*I can't draw, so I haven't done any drawing, I've written them.*" Patricia mostly*: "wrote answers to the questions."* Janice made an attempt to illustrate some of her answers and ideas: "*well I tried, not very successful.*" Some of the participants just answered the questions in writing. Seven out of ten participants did attempt to doodle, sketch and draw some of their ideas in order to better communicate them.

For some of the participants, antipathy towards the ideas resulted in short and abrupt answers. Of the possible 30 questions, Doris only completed 17. Agnes also left some questions blank or with very brief answers: "*no*" or: "*yes*" or: "*good idea!*" Over the 'One Time Card' she scrawled large crosses across each question and the illustration on the front. This was unusual however and most of the participants responded in detail. Agatha answered every question but one, and even here wrote something: "*pass on this one!*"

Whilst the immediate reactions of some participants suggested a significant amount of hostility towards many of the ideas, the discussions following these initial responses were very productive. As will be discussed in the following section, many of the eighty somethings had engaged with the cards and the research at a deep level. During the discussions it became clear that often the cards had been interpreted in ways the researchers had not expected. For example, the Pin Thimble was considered by the three groups as a very pointless idea. The idea for the Pin Thimble was that when it was placed onto the end of your finger and recognised your fingerprint, it would then (and only then) display your PIN. The participants in the first group interpreted the illustration on the front as a thimble that has your PIN permanently engraved on it. The researchers explained that the PIN would not be on display would only work when it was on the user's finger and nobody else's: "*Well, having explained it, it makes a bit more sense. You're not going around with this number showing everybody, which it appeared to be on the card*" (Frances). Occasionally then, ambiguous sketches and descriptions were sometimes entirely misunderstood. However these were often successful misunderstandings that allowed participants to articulate their concerns about new technology and the likely stupidity of its designers.

Our analysis of the data centred on three themes: *critique*, *coping* and *creativity*.

Critique: questioning the concepts
Most of the participants used their responses to the cards to be critical of the design ideas illustrated on them. Sometimes their critique would focus on implausibility, for example, the 'Exploding Handbag' containing a paint bomb to be activated if stolen. Frances wrote on the card: "*a bit far-fetched*". On other occasions practical reasons were given to disregard such ideas: "*I would not like the contents of my handbag to be covered in paint*" (Agatha, on card). More importantly, many of the responses signified much wider concerns with technology and contemporary culture. For example the 'Mobile Bank' card illustrating a van which would bring cash to the door provoked this comment from Marjorie:

"*I hope it never comes to this! Imagine a Country where people do not leave their houses because everything is brought to their door. It could reach a point where they*

never either see, or know, their neighbours or anyone else in the road!"

Similarly, Patricia responded to a question on automatic payment services with: *"are we not to take charge of <u>anything</u> ourselves?"* (Patricia's emphasis). Some of the ideas were associated with relieving people of some of their responsibilities. At the same time, during discussion the participants frequently speculated where the benefit would come from as many of the ideas were also seen to imply further costs to bank account holders: *"that will put bank charges up!"* (Agatha) or: *"they'd charge you extra for telling you that"* (Janice).

During the discussions between the researchers and participants one of the largest criticisms levelled at the cards was that some of the ideas and questions seemed irrelevant to their current needs:

"... these smart cards and a smart purse and a smart wallet and somebody coming to the door with the van to get you some money and so on, I suppose they are just ideas that you have suddenly produced to look into the future, but for me, so many of them were not applicable at all at this stage" (Frances).

Here, Frances is reflecting on the quotations placed on the inside front cover of the cards from participants in earlier stages of the research. Many of the quotes on the cards referred to people who were no longer mobile, but, as previously noted, all of the members of the workshops were mobile enough to climb two flights of steps to attend the session. This meant that in order to engage with the cards, many of the participants had to empathise with the descriptions of other people's experiences, and imagine what their own circumstances may be in the future. This was not easy, as Agatha made clear: *"It's very difficult to project how you would react in a situation until you are actually in it."*

Patricia in particular explained her difficulties in imaging some of the situations where the ideas on the cards might be useful: *"It's difficult for us ... not to think as middle class people. ... I just don't want things to go any different. I am quite satisfied with what we've got. I think that's the same for all of us."* Patricia's comment was reiterated by a number of participants but others sensed that change, desirable or undesirable, was inevitable: *"But if everybody else moves on, you've got to run along behind them haven't you? Or trail along behind them, you don't have the option"* (Ruth).

Some of the cards provoked quite impassioned responses about the general motives and morals of the banking industry. Rita felt particularly strongly about 'Disappearing Money' (intelligent banknotes where the print disappears when handled by an unauthorised person):

"If this actually came to pass it would be just a way for the banks and financial institutions to make more money for the
"fatcats" and the shareholders and to exploit the man in the street. It would be hidden behind buzzwords like "efficiency" "modern" etc. It would need more and more power to operate and we as a country will go into "power meltdown" in the future, unless there is a remarkable invention (soon) to guarantee power to be continuous in power cuts – as per the 39-45 war, the 1970s in the Eastern USA and UK 80s – how will society and a cashless one at that, cope then?"

For Rita the design of any 'technology' was inextricably linked to the ideology of the banking industry. The technology would lose people jobs, would trick people into spending more money, and continue to ignore wider economic issues. Whilst Rita's critical monologues were the most extreme, these views permeated many of the discussions we had with the eighty somethings.

Coping: workarounds and current technology
Several of the concepts were based on instances related in the previous study [35] of people sharing pin numbers. This practice was quite alien to the workshop participants. The 'One Time Card', 'Share Card' and 'Disappearing Money' cards were based on the topic of someone withdrawing cash or paying bills on another person's behalf. None of these participants had found themselves needing to do this but there was a palpable concern that they may have to in the future. Patricia wrote: *"it's a big worry. All* [my] *family live in* [the] *South. Luckily I have many trustworthy friends and neighbours who I can trust implicitly."* Others speculated about who they could trust in such situations: *"[I] wouldn't let home helps or other carers do this in view of some of the stories in the papers about theft, fraud"* (Agatha). When asked to consider designing something that would help in these situations, the reply across all of the groups was unanimous: *"a receipt"*. Many of the participants drew illustrations of receipts as their way of knowing someone had completed a transaction on their behalf.

The importance of pieces of paper as a way of coping with potentially complex situations appeared frequently in both the written responses and the discussions in the workshops. For example, Audrey explained: *"each month ... I keep a meticulous book with income and expenditure columns."* Janice had a similar procedure: *"I always know roughly how much is in my account so I never (yet!) get overdrawn."* Also confirming our previous observations, these new participants used pieces of paper to document hard to remember PINs and passwords. The reactions to the cards revealed this in far more depth however. Specifically, it became clear that whilst paper was highly beneficial to the eighty somethings, with it came dangers. Documenting financial information gave rise to the risk of people reading it and performing fraudulent activities. Many of the eighty somethings, therefore, would not write down the information as is but rather make attempts to disguise and codify it. Agatha would: *"hide it in code among telephone numbers in my diary."* She went on to reflect further down

the card: *"I know it isn't foolproof."* Similarly, Patricia would: *"put [it] in address book as fictitious names and tel. no. ending in pin number."*

Ruth was one of the few participants who would not write her details down. She was the only eighty something who used Internet banking, and kept all of her records on the computer. In terms of PINs and passwords, she wrote: *"I remember my pin number and password by association. If you could draw an object that reminded you of it, then that too could be deciphered by someone."* Rita also acknowledged the dangers of writing down these details, suggesting instead that she would *"pick a pattern on the key pad"* and remember this, rather than the actual digits of her PIN. Dolores also explored using visual clues as a way of avoiding writing down a PIN. During the workshops, she described her idea (see Figure 2):

"I thought [this] *was fun* [but] *it's rubbish ... that has a grid with numbers, as in a map, and then if you have some places or some mountains or rivers on your map, you would choose one and then you would grid numbers that you could work out from it. But that's a bit complicated."*

The idea was complicated, and the researchers asked her to clarify what she meant, she elaborated: *"you know how you have a four figure grid reference number on a map when you go hiking.... If on a map I decide Scafell Pike is where I am looking at, then my pin number would be Scafell Pike."*
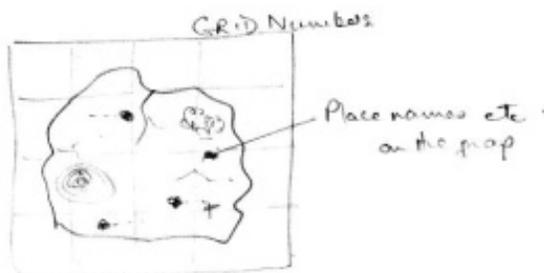

Figure 2: Dolores PIN password map

Although she derided her own idea, Dolores' suggestion emphatically combined her realisation of a problem with a possible solution from her own experiences (she was a keen walker). As these examples indicate even though many of the eighty somethings responded to the cards by criticising the ideas or discussing their own practices, often this became interwoven with the development of new ideas. This will be discussed in more depth in the final theme of creativity.

Creativity: engagement and dialogue
Clearly the concepts on the cards invited a large amount of criticism which perhaps in part, resulted from the great distance between the themes the researchers had identified as most pertinent to prior cohorts of eighty somethings and these new participants. Yet with these criticisms came opportunities for new ideas, particularly as participants discussed the cards between themselves. Dialogues un-mediated by the researchers would often occur, especially

around subjects where participants felt strongly but had diverging interests and concerns. The 'Pin Thimble' discussion highlighted in the *Results* section is an example of this. Having explained the idea in person, a number of the participants now understood it better and even considered it: *"a good idea"* (Ruth). The group started to discuss how the idea could be improved: *"perhaps you have it hanging around your neck?"* (Agatha). What followed was a communal exploration of what form the idea could take. Although all 6 group members participated in this discussion, the critique of the overall idea would be repeatedly returned to, especially by Patricia: *"I wouldn't like to go round with things round your neck, because anybody who really wanted your pin number would say oh she's got it because it's round her neck, I'll get her and put her finger in."* In situations such as this, there was no possibility of escaping a virtuous circle of criticism. Through this dialogical working out of the device, however, many of the participants began to imagine how it would be used, what advantages and disadvantages it might bring, and what other activities such a device might support.

There was similar discussion and development of the idea of a mobile bank that delivers cash to people's homes. Many of the participants saw the benefits of this service for those who were housebound but were worried about the idea of a money van parking outside their homes: *"It's pretty obvious if this van draws up at your door ... there'll be somebody lurking round this corner watching for when he comes. He has got his helmet on, she hasn't!"* (referring to the home owner in the illustration). Although agreeing that the delivery of money would be useful for some this participant pointed out that a van like the one in the picture (see Table 1) would make it obvious that the house just visited was now worth robbing. This criticism was followed by suggestions: perhaps it should be integrated within other services in order to disguise it from prying eyes. An idea put forward by a number of participants then was for mobile libraries (which used to be common in the UKs) to also dispense money, or: *"a mobile shop where they give you cash back"* (Ruth). In another workshop, Agnes suggested: *"you want different kinds of vans that just come round and don't show anything, white one ... or they should come in a broken down old car ... with a scruffy looking man with a sack over his shoulder!"* This then is a particularly clear instance of the ways in which a criticism of a questionable concept resulted in the generation of new service design ideas, albeit perhaps equally questionable.

We noted in the previous section that using paper to record financial information helped the eighty somethings cope with modern banking systems. A question on the 'Smart Purse' card asking them to imagine dealing with their finances in a "paperless" future incited wrath. *"Impossible!"* Rita wrote on the card. *"I cannot work a computer, therefore would have no feasible access to records."* Janice wrote in a paperless future she would: *"keep a careful note on my cheques ... or wait for my*

monthly statement." This was followed by further reflection: *"But cheques and statements need paper so not a very feasible suggestion."* Agatha suggested printing statements off the computer before realising this still involved paper. Doris simply wrote: *"I can't imagine"*.
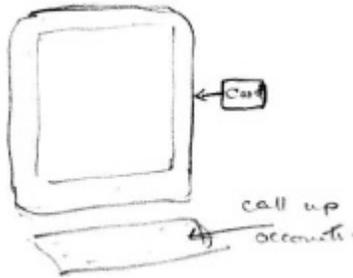

Figure 3: Dolores' Card Based Paperless Record Keeper

Although most of the responses to the notion of a paperless future resisted the notion altogether it did provoke some new ideas. For example, in reaction to the 'Smart Wallet' card, Dolores wrote on the card: *"I like the idea on the front of an iPad type wallet."* She went on to develop the idea further (Figure 3): *"But you could also, I feel, have a card that you could put into a computer or a screen and you would call up your accounts, and see them"*. Like the pieces of paper the eighty somethings already used, many of their ideas centred on artefacts that could be stored in specific places. Agnes also wrote down and planned all of her transactions every month but liked the 'Smart Wallet' concept: *"The fact that you've got something just to do quickly, your bank statement up and things like that, and check everything, and as I spent things I would put it into the calculator, and then everything would be all right."* As part of a paperless future, she imagined she could deal with it using *"two calculators, one for ingoings and one for outgoings and I'd put little abacuses on them."* Agnes found her design idea hilarious: *"I've got a wicked sense of humour!"* At the same time, her idea was practical because it embodied those values she finds so important in her checking routine.

Although the participants' suggestions were often as questionable as those on the card they indicated very clearly what was important to them, in this case the tangibility of accounts and a constant record they could update.

DISCUSSION
Previous work has suggested that older people are typically a challenge for HCI research due to their 'disinterest' in new technologies [10, 26]. While we found the participants critical of new banking technologies they were also fiercely interested in the research topic and its implications. A recurring response to all of the concept designs was—what is wrong with the way things used to be? What is wrong with cheques? What is wrong with cash? Learning PINs and passwords would never be as convenient or easy to use as the pen and paper based technologies they had used throughout their long lives.

Clearly there is an implication here not to design new technology [2]. This is important and it is at the heart of the Scandinavian tradition of participatory design. This emerged at a time when computing technology was being introduced for the first time to the workplace. Unions insisted that workers should be involved in the design of the new systems, partly to ensure that they were usable but also to ensure that the machines did not put their members out of work [22]. The eighty somethings here played a similarly political role in setting boundaries and saying "no". This critical engagement is not only salutary in technology development projects but also ethically necessary. However, the critiques suggested more than non-intervention: they were too unhappy with the existing state of affairs for that to be an option. Often, as with the 'mobile bank' concept, the critical responses led to suggestions and new ideas. The 'Pin Thimble' though initially derided was developed through discussion into more viable and useful iterations of the idea.

Methodological developments in participatory design such as the use of theatrical performance [3], future laboratories [7] and design games [4] explore ways of breaking away from current practices to collectively explore potential futures. Questionable concept cards differ as the researchers come to the workshop already laden with designs for the participants, even if these are still provisional and lacking form. These provided an immediate opportunity for criticism and for the participants to project their own practices and experiences onto each idea and card. Good graphic design is required here that conveys the concept to participants but also still allows for multiple interpretations. The 'Pin Thimble' card failed, at first, due to its failure to convey the idea at all.

The researchers, too, were also criticised albeit playfully. As Dolores explained her grid-reference based PIN system, Rita exclaimed: *"Don't assume they've done map reading!"* In another workshop, as it became clear that participants genuinely believed we had designed an artefact that had a PIN engraved permanently on it, one researcher noted, amidst much laughter, that they clearly thought: *"these boys at* [the] *University are idiots!"* The 'Pin Thimble' and some of the other ideas were transformed and developed through critique. Others remained questionable and subject to a deeper critique. New technology was implicated in supporting 'modern' banking practices that were by definition wrong headed. Modern banking was equated with making the banks more money, getting people to spend money they did not have, and encouraging a desire for the latest 'thing'. The feeling was that younger generations did not have the willpower to resist the technology and the banks, that they could not *"take charge"*.

There was also a wider critique of the current economic climate following the recent banking crisis. For these participants the retail banks had been party to a criminal enterprise. When the participants were younger the banking

sector had been represented by cautious local bank managers uncertain about whether to grant them a mortgage. The values represented by this figure of probity and good housekeeping had been overturned. The new banking was embodied in the digital payment methods the banks made available. "Make do and mend" had been replaced with easy credit and twenty four hour cash machines. The local banking of the past was seen as immediately accountable both for the individual and the institution. Banking was now global, remote and mediated by telephone or computer. For these participants financial mismanagement and modern technology were almost synonymous. They were concerned that younger generations were going to suffer from financial misadventure while their own generation was marginalised and forgotten.

One interpretation of these findings may be that it is another example of older people being hesitant to accept new technologies that do not meet their established practices [26]. We suggest that whilst familiarity is important to this age group, their critical insights are of a deeper significance. Critique is important not only in identifying problems but also in beginning to address them.

CRITIQUE AS A RESOURCE FOR DESIGN

This project was undertaken because it seemed clear that people over eighty are not well served by current banking practices. All of the workshop discussions confirmed this view. There were frequent denunciations of the banking industry and fierce defences of how things used to be done. While the workshops were being conducted there was much debate in the UK about plans to abolish cheques. This was often discussed in the workshops and any proposals for a replacement were met with angry opposition. Critical discussions of cheque replacement made it very clear that cheques were valued because of their tangibility, specificity and limited use [36]. This, in turn led the project team to further explore how these values can be embodied in the design of 'digital' cheques (see [37]). Initial concepts and prototypes were subjected to equally robust critique and consequently led to stronger designs (Ibid).

The team included both serious and playful ideas in the questionable concept cards. Ambiguous presentation and occasional misunderstandings encouraged new design insights. One example (the Pin Thimble) has been discussed here. The idea was initially derided partly, though only partly, because it was misunderstood. Criticisms of the design (you would lose it) led the eighty somethings to make new suggestions (you could wear it) which in turn led to further critique and suggestions. In this way the participants were able to engage in a critical dialogue which they clearly enjoyed. It was evident our participants found pleasure in highlighting the flaws in our ideas and arguments. These dialogues became part of an iterative design process which is still ongoing. Although this paper has focussed on the concepts that were more or less

discarded some were developed into working prototypes such as a digital cheque book reported elsewhere [37]. However, the dialogues generated around the weakest ideas were often as valuable as those around strongest. The space for critique allowed the eighty somethings to articulate very clearly not only what was wrong with current banking practices but what would probably be wrong with piecemeal technology focussed solutions.

The qualitative research methods literature is replete with warnings about the dangers of participants telling researchers what they want to hear [29]. In participatory design there is always a danger that participants may agree that this or that idea might be a good one in order to be polite. In no way were these eighty somethings hostile or impolite to the researchers yet they had no compunction whatsoever in telling the team that their proposals were impractical or silly. Their critical stance was encouraged by the questionable concept cards we gave them. Ambiguity as well as silliness provided a space for criticism, suggestion and re-iteration. The participants' critiques were multi level—not just on whether a technology would be usable but what its implications might be in terms of social or political effects. As with the Scandinavian tradition of participatory design, the eighty somethings represented their own generational interests; yet they were also concerned with what was to become of their children, grandchildren and great grandchildren.

These eighty somethings had a fear of debt and credit. They maintained lifelong habits of careful account keeping and living within their means. They were horrified by the banking crisis and the reckless greed of the industry. Although we are living through a period of great economic instability, most work at the intersection of HCI and the banking sector focuses on finding novel ways for us to spend money. These extraordinary workshop participants would not allow the team to be anything but mindful of the widest possible consequences of the technologies proposed. At the same time the workshops provided a space to develop ideas that were more in line with their values. As computing technology penetrates still deeper into human life, it is more important than ever before, to be critical.

REFERENCES

1. Bardzell, J and Bardzell, S. Pleasure is your birthright: Digitally enabled designer sex toys as a case of third-wave HCI. In *Proc. CHI '11*, ACM (2011), 257-266.

2. Baumer, E., and Silberman, M. When the implication is not to design (technology). In: *Proc. CHI '11*, ACM (2011), 2271-2274.

3. Brandt, E., and Grunnet, C. Evoking the Future: Drama and Props in User Centered Design. *PDC '00*, 11-20.

4. Brandt, E., and Messeter, J. Facilitating Collaboration through Design Games. In: *Proc. PDC '04*, ACM Press (2004), 121-131.

5. BBC. *EU austerity drive country by country*. http://www.bbc.co.uk/news/10162176

6. Blythe, M. and Monk, A. Notes Towards An Ethnography of Domestic Technology. In *Proc. DIS '02*, ACM (2002), 276-281.

7. Büscher, M., Eriksen, M., Kristensen, J., and Mogensen, P. Ways of Grounding Imagination. In: *Proc. PDC '04*, ACM Press (2004), 193-202.

8. Carelman J. *Catalogue of Extraordinary Objects*. Abelard-Schuman, London, 1971.

9. Charmaz, K. *Constructing Grounded Theory*. Sage, London, 2006.

10. Coleman, G., Gibson, L., Hanson, V., Bobrowicz, A., McKay, A. Engaging the disengaged: how do we design technology for digitally excluded older adults? In *Proc. DIS '10*, ACM Press (2010), 175-178.

11. Davidoff, S., Lee, M, Dey, A., & Zimmerman, J. Rapidly exploring application design through speed dating. *UbiComp '07*, Springer (2007), 429-446.

12. Dini, E. and Goldring, S. Estimating the changing population of the 'oldest old'. *ONS Population Trends*, 13 (2), (2008), 7-16.

13. Dourish, P. Implications for design. In *Proc. CHI '06*, ACM (2006), 541-550.

14. Gaver , W., Beaver, J., and Benford, S. Ambiguity as a resource for design. *CHI '03*, ACM (2003), 233-240.

15. Gaver, W., Boucher, A., Pennington, S. and Walker, B. Cultural probes and the value of uncertainty. *Interactions*, 6 (5), (2004), 53-56.

16. Gaver, W. Boucher, A., Bowers, J., et al. The photostroller: supporting diverse care home residents in engaging with the world. In *Proc. CHI '11*, ACM Press (2011), 1757-1766.

17. Glaser, B. G. and Strauss, A. L. *Discovery of Grounded Theory: Strategies for Qualitative Research*. Aldine Publishing Company, Chicago, 1967.

18. Financial Services Authority *Fourth annual report on progress towards the shared goal for banking*. Financial Services Authority, London, 2009.

19. Halskov, K. and Daslgaard, P. Inspiration Card Workshops. In *Proc. DIS '06*, ACM Press (2006), 2-11.

20. HM Treasury *Financial Inclusion: An Action Plan for 2008-11*. HM Treasury, London, 2007.

21. Kawakami, K. (1997) 99 *More Unuseless Japanese Inventions: the Japanese Art of Chindogu.* Harper Collins, London, 1997.

22. Kensing, F., and Blomberg, J. Participatory design: Issues and concerns. *Computer Supported Cooperative Work*, 7, 167-185.

23. Laukkanen, T., Sinkkonen, S., Kivijärvi, M., and Laukkanen, P. Innovation resistance among mature consumers. *Journal of Consumer Marketing*, 24 (7), (2007), 419-427.

24. Lucero, A. and Arrasvuori, J. PLEX Cards: A Source of Inspiration When Designing for Playfulness. In *Proc. Fun and Games '10*, ACM Press (2010), 28-37.

25. Mattila, M., Karjaluoto, H., and Pento, T. Internet banking adoption among mature customers: early majority or laggards? *Journal of Services Marketing*, 17 (5), (2003), 514-528.

26. Mitzner, T., Boron, J., Fausset., et al. Older adults talk technology: Technology usage and attitudes. *Computers in Human Behavior*, 26 (6), Elevier (2010), 1710-1721.

27. Newell, A. Arnott, J., Carmichael, A., Morgan, M. Methodologies for Involving Older Adults in the Design Process. In *Proc. HCII 2007*, 5, (2007), 982-989.

28. OFCOM. *Accessing the internet at home: A quantitative and qualitative study among people with the internet at home.* OFCOM (2009). http://stakeholders.ofcom.org.uk /binaries/research/telecoms-research/bbathome.pdf

29. Robson C. *Real World Research*. Wiley, New York, 2002.

30. Rutt, R. *The death of local banking*. MoneyWise, 26.05.2011. http://www.moneywise.co.uk/banking-saving/current-accounts/the-death-local-banking

31. Saga. As Bank of England keeps rates low, solutions sought for suffering savers. http://tinyurl.com/6b7qc67

32. Singh, S. and Morley, C. Young Australians' Privacy, Security and Trust in Internet Banking. In *Proc. OZCHI '09*, ACM Press (2009), 121-128.

33. UK National Statistics. Life expectancies 2008-2010. ONS, 2011. http://www.statistics.gov.uk/hub/population /deaths/life-expectancies/index.html

34. UK Payments Council. The Way We Pay 2010. UK Payments Council, London, 2010.

35. Vines, J., Blythe, M., Dunphy, P., and Monk, A. Eighty Something: Banking for the Older Old. In: *Proc. BCS-HCI 2011*, BCS (2011).

36. Vines, J., Dunphy, P., Blythe, M., Lindsay, S., Monk, A., and Olivier, P. The Joy of Cheques: Trust, Paper and Eighty Somethings. *CSCW '12*, ACM Press (2012).

37. Vines, J., Blythe, M., Dunphy, P., Vlachokyriakos, V., Teece, I., Monk, A., and Olivier, P. Cheque Mates: Participatory Design of Digital Payments with Eighty Somethings. In: *Proc. CHI '12*, ACM Press (2012).

38. Weber, A. The convergence of mobile data phones, consumer electronics, and wallets: Lessons from Japan. *Journal of Telematics and Informatics*, 24 (3), (2007), 180-191.

39. Wells, J. An inclusive approach to financial products. Age Concern UK, London, 2008.