

Supporting memory and identity in older people: Findings from a ‘Sandpit’ process.

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Abstract

Identity in old age is challenged by physical changes, evolving roles within the family, and life transitions such as retirement. Supporting identity is therefore important in later life, and might be assisted by media technologies which allow people to reflect on their lives, record their personal histories and share these with family, friends and caregivers. This possibility was explored in two creative ‘Sandpits’ with older people as part of the SUS-IT project, funded by the New Dynamics of Ageing programme in the UK. Discussions were held with PC and non-PC user groups of retirement age to understand memory and identity practices and elicit reactions to three novel product concepts. These included a *Reminiscing Radio* for life review, a *Story Lamp* for associating spoken stories with photographs and memorabilia, and a pair of virtual reality *Travel Glasses* for transporting you back to a special place in the past. The main findings of these discussions will be presented, along with concepts generated by the participants in a re-design exercise. This paper will also show how the sandpits enabled older people to be involved in the design process by allowing them to shape early design concepts through exploring their own ideas and motivations.

Keywords

Design; Older people; Design participation; Co-design; Quality of Life

Introduction

It is known that Digital ICT products have the potential to support and enhance the quality of life of older people by allowing them to live independently, mediate their wellbeing and prevent social exclusion. However with the continual development of technology, this may disadvantage some groups of older people who have never engaged with digital technology, or find it increasingly difficult to do so because of changing capabilities, social and/or economic circumstances. This can be made worse by the added complexity of using products or services that older people are unfamiliar with, resulting in them remaining or becoming “digitally unengaged” [1]. Successful inclusive design for this population is therefore about maximising the benefits of technology whilst minimising the number of users being excluded from enjoying them.

To engage and include older users in the digital world, it is crucial that designers are not only sensitive to older people’s changing needs and capabilities but are also able to shape technology developments into *appropriate* new products and services for this market. It is equally important that potential users (i.e. older people) are consulted and involved in the early conceptual stages of design, where they can express their dreams and desires, and flag and any mismatch between product

specifications and their own capabilities or need. This has not always happened in the past. Many products such as home computers and mobile phones were initially targeted at younger people and only later sold to an older population who were never considered in their original development. Those companies targeting markets including older people, face the challenge of explaining new technology concepts which may be quite alien to their experience, particularly in technologically naïve groups. This may be a disincentive to early user involvement in focus groups or brainstorming sessions, where some users may struggle to imagine the form and function of hypothetical technologies.

In this paper, we report the findings of an attempt to address this problem by involving and working *with* groups of older people in the early phases of digital product design. This was done through two creative design workshops or ‘Sandpits’ intended to give older participants a voice and role in specifying requirements for new and emerging ICTs. In this sandpit, we introduced the issue of memory and identity in old age to a panel of older people. Understanding and requirements were developed through direct discussions as well as reactions to demonstrations of design envisionments that aimed to support memory and identity in different ways. These envisionments were created in the form of open, ambiguous and physical product concept prototypes. In this process, we tried to give participants a starting point in developing their own ideas about the topic, and opportunities to co-design concept modifications and additions with us.

In fact this type of design participation, where we view older participants as not only potential users but also as creative partners who could bring innovative ideas into design covers the ideology of social innovation. Inclusive design practices aligns with social innovation where the latter is defined as “new strategies, concepts, ideas and organisations that meet social needs of all kinds—from working conditions and education to community development and health—and that extend and strengthen civil society” (http://en.wikipedia.org/wiki/Social_innovation). Not only should social innovation enable the satisfaction of needs not currently met, it should also increase the level of participation and empowerment of all in particular marginalised groups in society [14]. Through the Sandpit process the outcome was a set of new product proposals which we hope will be of value in their own right, and a number of lessons about the Sandpit methodology itself.

Sandpit topic: Memory and identity

The study was carried out in the context of the SUS-IT project, which is examining ways of helping older people to engage and stay engaged with new information and communication technology as they age [2]. While other parts of the project are examining the use and augmentation of existing ICTs, this part concerns the innovation of new technology with older people themselves. This is being done in four cycles, with each cycle covering a different topic area of relevance to an older population. Relevance here approximates to an area of life whose quality might be enhanced by new digital technology. In a first cycle, we carried out Sandpits on the overall computer experience of older people and envisioned a customised touch screen device for discussion through a three act play [13]. In this second cycle, we turned to indicators of quality of life in older people to select the topic of memory and identity support.

Quality of life (QoL) had been defined by Mendola and Pelligrini [3] as ‘the individual’s achievement of a satisfactory social situation within the limits of perceived physical capacity’ and by the World Health Organisation [4] as ‘Individuals’ perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns’. QoL is thus a broad ranging complex concept coloured by different perspectives and factors. Recently in a survey [5] done with UK older people aged 65 and over on their perspective of QoL, several main themes of what constitutes a good QoL

emerged from the study. Being independent and having control over one's life in old age is considered one of the factors in having a good QoL. Other factors that would constitute a good QoL include having good social relationships with family, friends and neighbours, having positive outlook and psychological well-being and maintaining good health and functional ability.

This literature suggests that the way an individual perceives themselves and their own identity is important to psychological well-being. From additional literature, the sense of identity appears to come under threat in later life from various life transitions such as retirement and frailty [6] [7]. Retirement may cause an individual to feel they are of no value anymore [6] and may cause people to review their post-retirement identities and roles [8]. Similarly the transition from the Third Age to the Fourth Age, characterise as a person leading an active later life to someone who becomes increasing frail and dependent, could cause a discontinuity in a person's identity. Such discontinuities during later life transitions can be overcome by maintaining identity in a number of ways and these include keeping active socially by building relationships and friendship, playing a significant role in the family, given the opportunity to talk about their present lives, and being able to reminisce alone and/or share their life histories with others [7]. Reminiscing with others may be particularly important to identity in the light of failing memory capacity in older people. This relates to autobiographical memory for one's personal life experience and has been linked to the sense of self [9]. What we experience, remember and make of an event (i.e. autobiographical memory) together with the construction and upkeep of who we think we are (i.e. self) shapes our personal identity [10]. These activities not only allow older people to keep a sense of self in relation to others but also allow them a degree of control over life transitions and thus help promote their identity and QoL.

Given the digitisation of personal media content, including photographs, music and video, and the presence of the internet for remote media sharing, new forms of life review and reminiscing are now possible which could improve memory and identity maintenance in older people. With this literature and objective in mind, we set about designing an initial trio of novel product concepts in this area as triggers for discussion and starting points for co-design of concept variants and additions. Additional literature relating to each concept was also consulted in the design process, but space prevents us from reporting that here.

Sandpit methodology: The extended focus group

In Spring 2010, we invited two groups of older people (of retirement age), to attend two one-day Sandpits on memory and identity. All participants were members of Age Concern Guildford, where the Sandpits were also held. A total of 16 participants were recruited for the Sandpits. Based on PC ownership and experience, they were separated into PC and non-PC user groups with 8 participants in each group. The small number of participants enabled effective facilitation as well as interaction between participants themselves. Our intention in working with both groups was to assess the influence of PC engagement on attitudes to the proposed concepts and involvement with the creative design process.

In each Sandpit, we held a morning session leading up to the presentation and discussion of three product concepts, and an afternoon session involving the co-design and sharing of new concepts. The general shape of each Sandpit was therefore that of an extended focus group, in which participants continue past the discussion of product concepts onto the re-designing of it. In general, every effort was made to make the day sociable and enjoyable for them, as well as informative for us, and this paid off in many positive comments afterwards and a high level of future volunteering.

The morning began with a short discussion session to understand and explore the concept of identity and the way that life stories and memories are currently shared.

This was followed by a demonstration of 3 product concepts showing ways photos and memorabilia, virtual reality and sound could be used to capture and share memories and reflect identity. Participants were given the opportunity to discuss the concepts after each demonstration. At the end of all three demonstrations, they were asked for their preferences on a ranking form.

After lunch, the 8 participants were split roughly into three groups corresponding to each concept. Each group was facilitated by a university-based designer who led an activity we called “Keep, Lose, Change”. Participants were encouraged as a group to decide on what they liked about the original concept and wanted to preserve (Keep), what they disliked and wanted to drop (Lose), and what else they would like it to do or do differently (Change). In this activity, participants often disagreed about design changes and had to negotiate a shared solution. Eventually they began to move freely back and forth between keep/lose/change options as different individuals threw out creative suggestions. The role of the facilitator was also important to this process. We took a conscious decision to play an active part in *co-designing* the revised concepts with participants, but without leading the suggestions. In practice this amounted to playing a sketching role to illustrate new product forms, and applying technical knowledge to the implementation of participant suggestions. Each team presented the revised concept back to the group for further discussion. In a final open activity for two teams, participants were asked to share a personal story before designing something completely different to handle the story content.

Design rationale

Our initial concepts were based on the insight that people have special places, times and objects that define their identities across a life span [11] [12]. Various design concepts were generated and discussed and eventually three concepts were selected for prototyping. These included a pair of *travel glasses* for travelling back in time to a special place, a *reminiscing radio* for listening to stories of special times, and a *story lamp* for playing back stories from special photographs or memorabilia (see Figure 1).



Figure 1. Travel glasses, reminiscing radio and story lamp prototypes

Concept 1. Travel glasses. Everyone has places which are special to them. It could be houses or neighbourhoods where we have lived and worked or where we went on holiday. Re-visiting these places often brings back many memories of the times spent in them. However it is not always possible to travel back in person. It might be the house or neighbourhood is no longer around, or it might be too expensive, time consuming or challenging to make long trips particularly in later life. The concept was to have a pair of immersive travel glasses that can transport a person back to a special place. When a person puts them on, it feels like they are back in the place itself and they can look and move around in it. The place they see could be as it is today or in the past as it was when they knew it.

To enable this envisionment, a virtual reality eyewear Vuzix iWear VR920 with 3 degree of freedom head tracker, audio and microphone capabilities was used. The glasses were linked to a laptop PC and Google maps with street view was used to show a 3-dimensional scene of a local street – Tunsgate Square in Guildford. Because this content shows the current state of the location, participants had to imagine that it could be changed to show Tunsgate as it used to be. They were also led through the location by a facilitator, in a semi-interactive tour driven by their conversational interests in various regions.

Concept 2. Reminiscing Radio. Imagine a radio that instead of playing programmes from various stations plays back your own as well as other people’s memories of events in your life history. The Reminiscing Radio is a device that we envisage would allow a person to record their own stories as well as get others to record their stories of them on to a timeline. Other media such as music and photos could also be incorporated onto the timeline. An antique radio was used as it was felt that the aesthetics might attract and bring a sense of familiarity to older users. Also, shared listening is a feature of the radio and conversations could be recorded while social interaction is taking place for example around a dinning table. An iPod touch device was used to represent the timeline display and the interface to the prototype.

Scenarios of how a user would record, playback, and move their memories along the timeline were sketched and simulated using Powerpoint, translated into PDF and exported into the iPod touch device. Pre-recorded audio memories of personal life events from an older couple who volunteered to assist in the project (i.e. childhood, Wedding day, learning to use a computer and 70th birthday celebration) and music (i.e. ‘See you later Alligator’ by the Comets) were stored in the radio. The demonstration consisted of scripted scenarios in which particular pieces of recorded stories and music were replayed.

Concept 3. Story Lamp. Most people have photographs or special objects that they keep as memorabilia in their homes. Imagine you could record the stories behind those photographs and memorabilia for yourselves, your family or friends, and attach them somehow. The Story Lamp was proposed as a device that would provide such a function. The aesthetics of a lamp was kept because it is a common household appliance and would be not viewed be as an intimidating device by non-PC users. It is also normally found on a desk or table where photo albums or objects can be placed.

The lamp has a speaker and a camera in the head and a sound recording device and memory in the base. When an object or photo/album is brought into view under the lamp it can recognise it and play any stories that were recorded when it saw the object before. To record a story, the lamp would take a picture of the object or photo/album to remember it for next time, and associate the recording with the object or picture. The lamp also incorporates a projector that allows digital photos to be displayed on the table or wall. A camera card slot in the base allows the lamp to access digital photos. Stories can be recorded and play-backed on these projected images as well.

The Story Lamp prototype was mocked up with the bulb holder of a desk lamp removed and a HP laptop speaker was attached in its place. The lens of a PCLine 300a webcam was placed beside the speaker and an Optoma Pico PK 102 pocket projector installed beneath the lamp head. Pseudo buttons and memory card slots were also added to the base of the lamp. The Story Lamp was connected to a PC laptop where the content was located.

Results

Because of space limitations, we focus our results section on feedback on the concepts and their re-design by participants themselves. This will be followed by

discussion of implications for the design of products in this area, and lessons on the methodology. Both PC and non-PC user groups were asked to rank the three demonstrated concepts in order of preference (with “1” being the most preferred), and to indicate which concept they would actually want to purchase. Both the Reminiscing Radio and Story Lamp concepts were popular with PC and non-PC users. However in terms of purchasing the concepts, Non-PC users were much more inclined to do so than PC users. In general, non-PC users liked the simple appliance nature of the concepts, while PC users wanted them integrated into their existing ICT appliances. Table 1 shows the summarised results from both groups.

Table 1. Rank preferences and purchasing intentions for the three initial concepts
 (a) Non-PC user group (b) PC user group

	Rank order	Want it? (Y%)		Rank order	Want it? (Y%)
Reminiscing radio	1.25	100%	Story Lamp	1.75	25%
Story Lamp	1.63	63%	Reminiscing radio	2	12%
Travel glasses	2.63	36%	Travel glasses	2.25	25%

Travel Glasses

The non-PC users enjoyed the demonstration of the glasses but were not sure about the usefulness to daily life. They also felt that it would not be the same experience anymore because the places and people they knew and houses that they have lived in might no longer be there or might have been altered: *“It’s the people that make a place isn’t it, so catching them back?, you know, I remember the neighbour used to shout at you if you wouldn’t rushing to school and things like that.”* Another participant commented that re-visiting a place would diminish the experience, as the impression of the place will be different for different occasions.

Several participants suggested using a kind of augmented reality (AR) to overlay scenes of yesteryear on current day scenes. This might be done while walking around the actual place in a kind of ‘compare and contrast’ activity: *“...I am walking now in Guildford so, I can compare and contrast, for example, I am looking at what is present now in relation to what was a year ago so that will be very, very useful, it will be quite instant quickly.”* PC users felt that using Google street view was not immersive and interactive enough. They explained that the transitions of the scenes were too jerky and there was a feeling of being “let down” as they were expecting people and cars seen in the glasses “to do something”.

Ergonomically, they felt the glasses were too bulky and didn’t fit well with people wearing spectacles. They would want the Travel Glasses to be light and simple: *“look like nice-looking glasses or sunglasses”*. They suggested adding a remote control that can be placed in a pocket. One participant also suggested having remote viewing to see what another person is seeing (virtual co-existence) and being able to chat with each other. Most PC users did not think the glasses would be of any use to them personally, but suggested that people who are disabled and housebound might find them more useful. Using the glasses together with activities such as cycling (on a stationary exercise bike) or hang gliding and visiting places you have never been to and not just the past was preferred by some from the non-PC group.

In line with these comments, the PC and non-PC sub-groups designed the concepts shown in Figure 2. The non-PC group designed a pair of *augmented reality goggles* for superimposing past scenes on present ones, and also incorporated a camera for recording journeys and replaying them later on the goggles at home. They also suggested the purchase of more varied content, such as cycling tours, cooking instructions or travel to tourist locations. The PC group designed a pair of *communicating sunglasses* with remote control, to allow pairs of users to experience each others point of view and soundscapes. They also suggested recording features for capture of personal experiences and asynchronous sharing of trips.



Figure 2. Augmented reality goggles (non-PC group) and communicating sunglasses (PC group).

Reminiscence Radio

Generally most of the participants liked the concept of the Reminiscing Radio but in terms of “wanting it”, non-PC users had some reservations. Some are not sure whether they will be motivated to consciously record stories about themselves for themselves. They would rather do it together with friends. *“I don’t really want to do it just for myself but I mean if you are going out with old friends or, you do reminiscence, do you remember the time we did this or we went to do that, that would be quite useful I think, in a group or your friends you don’t see so often. For just yourself that will be a bit boring. Ego centric.”* The suggestion of doing it as an autobiography for their children or grandchildren seems to be more attractive for them: *“It would be more interesting to future generations, more useful perhaps than just doing it for yourself.”* The PC group also thought that it would be something beneficial and fascinating for their grandchildren or great grandchildren, who would be interested in the life of their elders whom they know very little about. They thought it would also be useful for helping grandchildren with school history projects.

When asked about the form of the device, the PC user groups preferred the Reminiscing Radio to be a portable, modern device rather than the antique design shown. While the non-PC group was fine with the antique aesthetics, they would like it to be portable as well. Participants commented that memories and reminiscing could happen anywhere and thus having something portable, accessible and able to record quickly would be beneficial. Both groups liked the touch screen controls as opposed to physical knobs. They also wanted larger screens as they find the screen of the iPod touch too small.

The results of the later re-design activity are shown in Figure 3. The non-PC group produced a *Re-shaped reminiscing radio* by reducing the size of its body but increased the display size. They also included a line-in to allow audio recordings from existing CDs or tape to be captured, and a record feature for current radio programmes. Participants from the PC group turned the concept into a piece of *reminiscing radio software* for a laptop or desktop computer. The timeline feature was preserved and enhanced with a calendar format to give better organization of memories. Being able to include photos, music and other broadcast media like news was also suggested.

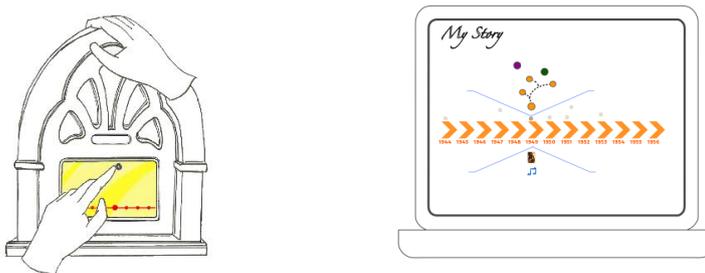


Figure 3. *Re-shaped reminiscing radio* (non-PC group) and *Reminiscing radio software* (PC users).

Story Lamp

Participants liked the Story Lamp and were intrigued by the playback of stories from photograph albums: “That’s interesting, a talking photograph... Its quite useful, you often flip through photo albums but you don’t know why the photo was taken or what a day it was, its just a photograph whereas if you incorporate narrative, how that photograph comes to be taken, why, when, what time of day...” Participants were also impressed when an object (i.e. elephant statue) was recognised by the Story Lamp which then began narrating a story about it. They liked the fact that it can scan objects and photos for future reference and record stories about them. They felt that they would be more inclined to audio annotate albums in later life as they have more time and want to leave something for posterity and family. Interestingly, one non-PC user suggested that the use of photos, words and narratives through the Story Lamp could be useful for learning languages.

When shown the projection of digital photographs, reactions were more mixed: “*It might be useful if you are in a place where you don’t have a computer or a photograph album*”. This view was offset by multiple complaints about the poor visibility of the images from the pico-projector even in a darkened room, and the fact that rectangular photos appear trapezoidal when projected onto a table surface. Older people may be particularly sensitive to low contrast images which become harder to see with age. Consequently they suggested relaying the images to the TV, PC or another LCD screen nearby. In fact, several members of the PC user group suggested incorporating the entire device into a PC, as with the Reminiscing Radio.

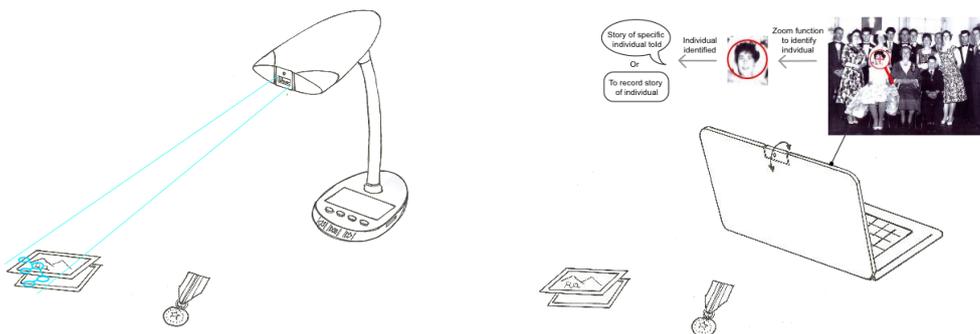


Figure 4. Multimodal story lamp (non-PC group) and laptop media scanner (PC group).

These views were reflected in the re-designed concepts shown in Figure 4. Non-PC users preserved the stand alone functionality of a *Multimodal story lamp*. This had an integral projector for large screen photo display in the dark, but also a smaller LCD display in the base. It also had two modes for enriching the audio-visual associations between stories and objects. In *Object mode*, photos or objects would trigger multiple recordings of related stories and images. In *Story mode*, the Lamp projects images related to a story the user is telling live. PC users incorporated the lamp functionality into a *laptop media scanner*. This had a swivelling webcam on the lid to allow scanning of objects and photos from behind the laptop as shown. Spoken stories could be associated with scanned images, and also with individual people shown in photographs through a zoom/tag function. The application could be linked to a website that makes content available to family and friends.

Discussion

As predicted by the literature, older people in our study were intensely interested in the idea of recording and sharing personal stories and how they might do this better.

All participants found some merit in each of the initial product concepts we showed them, but all were critical of various features and motivated to improve them in their own designs. Although we didn't ask people to rank and vote on the final designs, it is likely that a variant of the reminiscing radio or story lamp would have come out top, with a far greater proportion of participants wanting to buy the devices they personally designed. Interestingly, there was no single winning idea in the study, but rather a collection of attractive functionalities which took on quite different forms for the PC and non-PC groups. Chief among these were the ability to record and playback spoken narratives, to arrange them on a timeline in relation to each other, to link them to photographs and memorabilia, and to share or leave them with others both now and in the future. Other functions associated with the travel glasses for re-visiting special places were less attractive, but effective in triggering the discussion of more appealing activities such as travelling to new places, doing extreme sports or accompanying others on remote journeys.

The fact that PC users wanted to incorporate most functionality into their laptop or desktop computers whereas non-PC users wanted to use specialised appliances, is highly significant for the design of products in this area. It suggests that product offerings should be packaged in a variety of forms which attend to the technical knowledge and infrastructure of different segments of the 'older population'. People varied widely on both dimensions in our sample, and this dramatically affected their reaction to individual product ideas and the way they chose to reinterpret them for their own situation. While PC or stand-alone versions of concepts emerged in this study, a more sensitive sampling of participants on knowledge and infrastructure might have yielded a greater variety of reactions and re-designs tailored to additional ICT devices such as the television, gamestation, desktop or mobile telephone. The ultimate design process in this context might be a bespoke one, in which users select which platform they would like to use for which new function being offered, or at least the range of platforms they have available to use as hosts. This should not preclude the invention of new platforms such as the ones we have suggested here, but rather diversify the way in which digital services are commissioned, designed and customised to different people and infrastructures.

The possibility of involving older people in this process of design has been demonstrated by our Sandpit process. Participants themselves were surprised with how far this took them into the issues and practice of design itself, and all enjoyed the chance to be creative as well as critical. Participation in design, like design itself, was affected by the level of PC knowledge and engagement across the two user groups. PC users were more articulate and confident about their design ideas, but tended to concentrate on technical details and the implementation of features in their discussions. Non-PC users were initially more reticent to modify designs and less knowledgeable about what was technically possible, but consequently tended to explore the functionality and value of ideas more thoroughly. Both groups came up with very creative modifications and extensions to our initial ideas, as shown in the re-designs of Figures 2, 3 and 4. They also generated more radical new ideas in the final design activity, not described above, including a recipe memory book, a ceiling projector, a story blanket, and recording jackets and pendants. In terms of an extension to focus group methods, the Sandpit re-design activity allowed participants to express views from the focus group in new designs of their own, and to explore some of the trade-offs and compromises that have to be made to make a design idea work holistically. Creative ideas that began to emerge in critical discussion could therefore be taken further and developed into new and better design proposals than those initially shown. We believe this is an advance on pure brainstorming techniques which provide too little design foundation for technologically naïve users, and focus group discussions which stop short of concerted re-design itself.

Acknowledgements

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