Fostering Social Innovation For Active Ageing

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This paper presents the results from a radical-digital loneliness intervention we developed for older adults based on our hybrid approach of Social Innovation for Active Ageing (SIFAA), described within. Age-related loneliness is a major social issue as it is increasing alongside an upward global population trend which predicts that nearly 22% of the world population will be aged 60 years or over by 2050. This 'silver tsunami' represents an unprecedented growth of the elderly population and is likely to exert socioeconomic pressure globally in the form of healthcare needs, etc. In this paper, we recognise that the 'activity theory of ageing' provides a good foundation for developing effective strategies for tackling loneliness amongst older adults and we highlight its potential and restraints in this area. We propose that combining it with 'social Innovation' can ease its fixation on the individual as the 'unit of analysis'. We examine both these theoretical frameworks to discuss how a hybridisation of activity theory of ageing and social innovation can allow for a significant movement away from the dominant incremental approach to developing loneliness-interventions. We call this hybrid approach Social Innovation for Active Ageing (SIFAA). Having reviewed how we developed the SIFAA approach, we discuss the findings from our action research project for older adults based on SIFAA.

Keywords: loneliness; ageing; interventions; radical; digital; social innovation; activity theory; active ageing; action research; ethnography.

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Combating age-related loneliness

It has long been understood that loneliness is closely associated with ageing (Demakakos, Nunn, & Nazroo, 2006; Kaasa, 1998; Sheldon, 1948). Wilkes opines that loneliness is in fact 'the main problem' associated with later years of life (1978). Loneliness is perceived as an indicator of increased blood pressure and is known to be detrimental to both physical as well as mental health (Cattan, Newell, Bond, & White, 2003; Dean & Lin, 1977; Louise C Hawkley, Masi, Berry, & Cacioppo, 2006; Louise C Hawkley, Thisted, Masi, & Cacioppo, 2010; Masi, Chen, Hawkley, & Cacioppo, 2011; Murphy, 2006; Stuart-Hamilton, 2012).

However the relation between age and loneliness is not as straightforward as it appears. Kaasa warns against making stereotypical connections between old age and loneliness as that can contribute to an erroneously gloomy perception of all older people as being lonely and unhappy (1998). The occurrence of loneliness among the elderly has been found to vary in different surveys. This variation can be attributed to differences in cultures, countries, age-ranges and rural-urban differences, etc. (Jones, Victor, & Vetter, 1985; Kaasa, 1998).

Global demographic forecasts suggests that nearly 22% of the world's population will be aged 60 years or over by 2050 (Rutherford, 2012). This 'silver tsunami' (Cacioppo & Patrick, 2008) is unprecedented and is likely to exert socio-economic pressure globally, especially in the healthcare sector (Dychtwald & Flower, 1989; O'Connor, 2014). Increasing loneliness amongst this demographic is naturally then a serious concern amongst policy makers (BBC News, 2013; Bingham, 2012; Marsh, 2014). Early evidence of this pressure can already be seen on National Health Services (NHS) in the UK. For instance, apart from elderly patients who need medical attention due to age-related health conditions such as blood pressure problems and depression, it has also been reported that in a bid to cope with their loneliness, some elderly users tend to visit their General Practitioners (GPs) more frequently for company rather than for medical advice. Castle Point Association of Voluntary Services Befriending Scheme (CAVS) refers to such elderly service users as 'frequent flyers'.

Recent surveys conducted in many parts of the world such as the USA, the UK and Japan reveal that many older people report feeling lonely 'often' (Louise C. Hawkley & Cacioppo, 2007; Kim et al., 2009; Marsh, 2014). As a society we have been trying to 'tackle' this seemingly impenetrable problem

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of loneliness amongst older adults for some time. For example, some of the strategies examined by Cattan, White, Bond, & Learmouth (2005) in their systematic review of 'interventions' aimed at reducing loneliness amongst older adults were developed nearly thirty years ago. The fact that we are still trying to address similar (if not the same) issues at present, highlights a clear need to reflect upon our existing approach to mitigating loneliness so that we can develop more effective loneliness interventions.

More recently, Sharma, Blair and Clune (2015b) have critically examined the current methods and techniques that we have developed as a society to combat age-related loneliness in order to recognise any 'patterns' (Alexander, Ishikawa, & Silverstein, 1977). They argue that the current thinking around designing loneliness interventions predominantly adopts an incremental approach and they have highlighted a gap in knowledge exemplified by the lack of 'radical-digital' interventions (Sharma et al., 2015b). They also suggest that more experimentation is required in this area to understand the opportunities presented by, and the limitations of, radical-digital loneliness interventions. This paper therefore A. presents an overview of what we mean by radical-digital interventions, B. presents an argument as to why 'activity theory of ageing' combined with 'social intervention' may offer a promising way forward to address loneliness, prior to C. presenting and reflecting on our empirical attempt to develop a loneliness intervention via an action research case study that integrates activity theory and social innovation – what we are calling Social Innovation for Active Ageing (SIFAA).

Looking at radical-digital loneliness interventions

As a society, our strategies to tackle loneliness can be psychosocial or pharmacological. For instance, it can be argued that because the indicators of loneliness are very similar to those of depression (O'Connor, 2014; Stuart-Hamilton, 2012), the treatment prescribed for both of them can be similar too. Symptoms of loneliness (and depression) are either treated pharmacologically using antidepressants or other medication, or by relying on non-medical methods such as through network interventions aimed at enhancing social contact.

The interest in developing and examining loneliness interventions emanates from an idea embedded in cognitive theory that loneliness can be manipulated using psychosocial methods (Cattan et al., 2005). Thus loneliness interventions have been designed to either prevent loneliness,

provide support to those who suffer from it, or as remedial services (Windle, Francis, & Coomber, 2011). Masi et al. highlight the economic rationale for our *investment* in loneliness interventions. They suggest that loneliness interventions are an effective way of reducing the high costs associated with managing problems related to loneliness (2011). In this paper, we have focused on such non-medical or non-pharmacological approaches, i.e. interventions that have been developed to regulate age-related loneliness.

Incremental vs. radical

Traditionally, being 'radical' has been associated with 'having a certain view of the possibilities inherent in history – radicalism meant breaking away from the hold of the past' (Giddens, 1994 p. 1). Political radicalism is often closely associated with reform through agitation and revolution (Meisel, 2014). However, in its non-political avatar too, radicalism is rooted in cutting loose from convention. Tellis et al. suggest that radical innovation drives growth in firms and economies by 'destroying' old markets whilst creating new ones (2009). Manzini opines that incremental innovations represent our existing ways of 'thinking and doing' and innovations that fall outside our current ways of thinking *and* doing characterise radical innovation (2014). Also, Norman and Verganti define *incremental* innovation as 'improvements within a given frame of solutions' or 'doing better what we already do' and *radical* innovation as 'a change of frame' or 'doing what we did not do before' (2012 p. 5). This is akin to Dryzek's 'reformist' versus 'radical' departures in environmental discourses (2005, p. 14). Reformist methods are similar to incremental approaches as they seek solutions within familiar modes of rational management, while radical departures argue for a comparatively significant movement away from industrial modes of living and being.

Radical ideas are now being encouraged in healthcare too with UK's Health secretary, Jeremy Hunt, calling for families to think 'radically' about taking care of their elderly relatives (Martin, 2015). In Sharma et al.'s review of loneliness interventions developed for the elderly, a vast majority (77%) represented incremental innovation. They argued that designers can play a crucial role in fostering radical innovation in this area by creatively recombining existing resources, knowledge, ideas, etc. (2015b).

Digital vs. physical

Turner suggests that digital technology has now become a 'defining characteristic of modern life' (2013 p. 8). To put this into some kind of perspective, it is believed that today we live in a world where the number of devices connected to the Internet is greater than the number of people on earth (Frey, 2012). This scale and prevalence of digital technologies has the potential to augment the outreach of care services developed for the elderly. According to Kraft and Yardley,

'The digital environment (e.g. Internet, mobile phones, smart phones) that is now an integral part of our daily lives is becoming an increasingly important means of sustaining the health of people worldwide, whether by providing access to a wealth of information, by linking geographically dispersed communities of peers and professionals, or by supporting self-management of health and illness' (2009 p. 615).

The ubiquity of digital technologies, their ability to overcome mobility issues, and their usage as alternate infrastructure make digital technologies an extremely potent option to explore when designing loneliness interventions for the elderly (Dhruv Sharma, Lynne Blair, & Stephen Clune, 2015a). Han and Braun highlight the 'critical' role that digital technologies and digital literacy play in active ageing by facilitating participation and social connectivity through enhanced communication (Han & Braun, 2010).

Extending active ageing

Although 'active ageing' lacks a precise universally accepted definition (Walker, 2006), Walker and Maltby trace its roots back to activity theory of ageing (2012). Activity theory of ageing (ATA) is a perspective on ageing proposed by Havinghurst (1961), who suggests that there are no differences between middle-aged and old people, with the exception of biological and health-related aspects. In the activity theory, it is assumed that continuing the activity patterns and values characteristic of middle age is essential to having a rich and satisfying life (Wadensten, 2006). Or as Walker suggests, successful ageing is achieved 'by denying the onset of old age and by replacing those relationships, activities and roles of middle age that are lost with new ones in order to maintain activities and life satisfaction' (2006 p. 83).Therefore activity theory displays a 'functionalist perspective' (Schulz, 2006) and it assumes a positive relationship between a person's level of activity and life satisfaction. This increases a person's 'self-concept' or how

positively one perceives himself or herself and enhances adjustment in later life (Diggs, 2007).The application of activity theory looks to encourage or support older adults in remaining active beyond middle age by finding replacements for these 'lost roles' and social positions (Diggs, 2007). Or as Schroots puts it, activity theory calls for the substitution of old roles by new ones in an elderly persons' life to ensure a positive sense and a better quality of life (1996). Although very popular in public healthcare, activity theory has been criticised for overlooking inequalities in health and socio-economic status. It is also questioned for neglecting other important factors such as personality traits and lifestyle characteristics (Bengston & Putney, 2009; Diggs, 2007).

Table 1:   Review of loneliness interventions. Source: Adapted from Sharma et al. (2015b)

Name of the Intervention	Incremental	Radical	Digital	Physical
Silverline	Yes			Yes
PARO		Yes		Yes
Building Bridges	Yes		Yes	
GoodGym		Yes		Yes
Mindings	Yes		Yes	
Seniornet	Yes		Yes	
Speaking Exchange		Yes	Yes	
Devon Community	Yes			Yes
Upstream	Yes			Yes
Psychosocial	Yes			Yes
Nubian Life	Yes			Yes
CWP		Yes		Yes

SPOC	Yes		Yes
CAVS	Yes		Yes
Homeshare		Yes	Yes
Older Person Partnership	Yes	Yes	
Circle	Yes		Yes
VoP	Yes		Yes
Springboard	Yes		Yes
Healthy Ardwick	Yes		Yes
HASP	Yes		Yes
Craft Café	Yes		Yes
Brendoncare	Yes		Yes
Social Care Direct	Yes		Yes
Bristol Link	Yes		Yes
Well Aware Website	Yes	Yes	
Dorset Wayfinders	Yes		Yes
Phone a friend		Yes	Yes
Winter Plan	Yes		Yes
GP Social	Yes		Yes
NE Lincolnshire Older		Yes	Yes
Total	24	7	6	25
Percentage	77%	23%	19%	81%

In order to examine if radical-digital interventions were successful in replacing lost roles of the elderly, we revisited the interventions reviewed by Sharma et al. (2015b) and critically examined them using a design lens. Upon

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deconstructing and reconstructing the interventions reviewed by them (see Table 1), we found that most of the interventions that they identified as being 'radical' provide the elderly users something more than someone to speak with or the information that they may require. With the exception of PARO, a robotic seal that brings the known benefits of animal therapy to elderly care (Sabanovic, Bennett, Chang, & Huber, 2013), all the other radical interventions that were reviewed appeared to treat the elderly as providers rather than as recipients alone. For example, the elderly have a crucial role to play in GoodGym (Barkham, 2012). They provide the necessary motivation for keen runners to stay committed to running. Similarly, in Speaking Exchange (2014), their role is not of a service user alone but it is one that entails offering support to help non-native English speakers brush up their English speaking skills. Homeshare is another great example where by giving someone a house to live-in, older people contribute to other peoples' wellbeing while being cared for simultaneously (Butler, 2012).

　　Thus it is not just 'someone to speak with' that these radical interventions have to offer to older people. What these interventions actually provide the elderly is an opportunity to have a *new role* to play in the society, one where they can act as solutions to someone else's problems. Therefore by building loneliness interventions where the elderly person's role is not restricted to being a user of that service, but one where they can offer support or help to someone else, we can begin to create radical interventions.

　　Adams et al. have demonstrated that social, leisure and productive activities have significant associations and predictive relationships with aspects of wellbeing in older adults (K. B. Adams, Leibbrandt, & Moon, 2011). According to them, 'Although differences in definition and measurement make it difficult to draw inferences about this body of evidence, methodologically rigorous studies generally find positive associations between activity and wellbeing' (2011, p. 704). Rowe and Kahn have also emphasised the role of 'social engagement' in their definition of successful ageing. They define social engagement as either 'remaining involved in activities that are meaningful and purposeful' or 'maintaining close relationships' (1997), emphasising 'productive and social aspects of activity for successful ageing' (K. B. Adams et al., 2011, p. 684).

　　Although the application of ATA looks to substitute older adults' lost roles by new ones (Diggs, 2007; Schroots, 1996), McClelland argues that

ATA's *atheoretical* attempt to predicting healthy ageing is centred around the 'isolated individual'. According to him, 'Although the activity theorist may not see the individual as literally isolated, but rather integrated into a social context, the specific nature of that social context is never spelled out' (1982, p. 724). Because ATA is fundamentally fixated on the individual as a unit of analysis, its desired 'social' applicability is naturally then, restricted. In order to look for 'new' roles for the elderly, ATA needs to reach far and wide and look beyond individuals and their immediate social contexts.

Fostering social innovation

 'New ideas' that help in meeting 'social goals' represent social innovation (Mulgan, Tucker, Ali, & Sanders, 2007). Manzini defines social innovation as 'a process of change emerging from the creative re-combination of existing assets (from social capital to historical heritage, from traditional craftsmanship to accessible advanced technology), the aim of which is to achieve socially recognised goals in a new way' (2014, p. 57). While discussing social innovation's strengths, Manzini also invokes its ability to look at problems as solutions, to someone else's problems (Social Innovation Generation, 2012). This idea is central to our thesis because it can provide a much-needed fresh perspective to ATA if we want to create radical interventions by finding new roles for the elderly in order to ensure healthy ageing.

We propose the use of social innovation to help ATA broaden its scope in order to overcome its contextual limitations. The social restraints of ATA can be eased by bringing social innovation into the equation, because by its very nature, social innovation focuses on fostering communal environments that are conducive to bottom-up innovation (Manzini, 2014). This shift in focus from *an individual* to *the society* can potentially encourage and involve previously unengaged participants in innovative and unimagined ways and provide ATA with a means to explore wider contexts. This consequently might increase the likelihood of finding richer, more inclusive roles, support new kinds of social mobility and provoke new grounds for the elderly to actively participate in society.

Social innovation's inherent ability to 'creatively recombine' different problems such that they address each other, allows for two things that can help in developing ATA-based radical interventions for loneliness; 1. This brings in new stakeholders (previously unimagined) into the equation, thereby increasing the likelihood of finding new roles for the elderly, and 2.

It changes the elderly's position from being users or recipients of a service to being providers as well. This change in elderly's status also directly addresses ATA's call for finding suitable replacements for their 'lost' roles and is radically different from existing loneliness interventions where the elderly are usually the recipients of various forms of help. Thus a hybridisation of activity theory and social innovation can allow for experimentation aimed at exploring the opportunities, rather than the problems, presented by this 'age wave' (S. Adams, 2011; Dychtwald & Flower, 1989). We call this approach Social Innovation for Active Ageing (SIFAA). Famous anthropologist Ralph Linton has highlighted how an individual's 'role' in the society ultimately defines his / her 'status' (Linton, 1936). We believe that SIFAA can act as an enabler that looks at the ageing population as an asset or a resource, a position they've traditionally held in the society until recent times, of bearers of knowledge, experience and wisdom, rather than looking at them as a financial and social liability that needs to be managed.
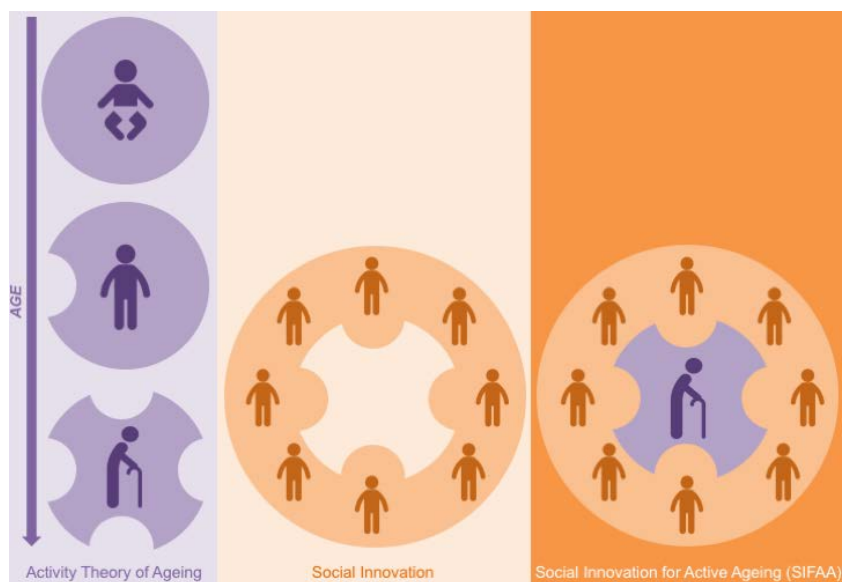
Figure 1: Replacing 'lost roles' of the elderly through social innovation

The first column in Figure 1 represents the progressive depletion of roles of an individual with increasing age, as suggested by ATA. The second

column depicts the 'communal environment' fostered by social innovation where the focus is on the society and not the individual. The third column in Figure 1 suggests that we can suitably replace the lost roles of older adults by focussing on the community and by enabling 'social' innovation. This means looking at older adults as a part of the community and concentrating on how they can offer help or support to someone in the community who might benefit from their skills, knowledge, and any other capabilities they may have acquired over time.

We argue that it is only through experimentation in this area that we will be able to understand SIFAA's strengths and limitations and make a significant (radical) movement away from our current ways of dealing with loneliness. We believe that trialling out radical-digital interventions founded on a SIFAA approach would be a first step towards exploring the potential impact of our proposed hybrid framework.

Developing radical-digital loneliness interventions using SIFAA

Sharma et al. have suggested that rather than developing radical-digital interventions *from scratch*; designers can play a crucial role in finding ways of giving a radical-digital makeover to existing interventions that may not be so at present. They have highlighted designers' innate ability to act as facilitators, communicators, capability builders, strategists, researchers, entrepreneurs and co-creators to find ways of radicalising and *digitalising* existing loneliness interventions (2015b). We believe that SIFAA can act as a guiding principle to assist such transformation by using social innovation to bring in previously unimagined stakeholders into the mix that could suitably replace the roles of older adults from being receivers (of help) to becoming providers instead.

In order to empirically test our theoretical notion of SIFAA, the authors carried out design brainstorming sessions to come up with radical-digital loneliness intervention concepts. Both brand new interventions as well as strategies to radicalise and digitalise existing ones were explored in these sessions with a constant focus on building upon each other's ideas. All ideas were then recorded on a specially designed template to ensure that they contained crucial elements of both social innovation as well as active ageing in order to shortlist SIFAA-based concepts.

Table 2   The template to shortlist SIFAA based ideas

Problem 1	Loneliness amongst older adults in the UK		Social Innovation
Problem 2			
Can they be 'creatively recombined' to address each other?	Yes (How?)	No (Why?)	
What is the role of the older adult?	Receiving help	Offering help (How?)	Active Ageing

After reviewing all the shortlisted suggestions from the brainstorming sessions, we decided to pursue an idea that looked to transform an existing incremental-physical loneliness intervention into a radical-digital one. Our idea looked to connect older adults in the UK with students in India via *videocalling*, giving the latter an opportunity to improve their English speaking skills by conversing with native speakers of the language. Through this arrangement, we wanted to understand whether older adults could provide help, support and guidance to the Indian students who were keen on improving their communication skills. This approach was aimed at addressing two problems by combining them in a symbiotic way such that they addressed each other. By doing this, we looked to provide older adults an opportunity to speak to someone and secondly, we expected to contribute to the overall skill building of the Indian students.

Table 3:   Logging the shortlisted idea

		Social Innovation
Problem 1	Loneliness amongst older adults in the UK	
Problem 2	Lack of educational resources/infrastructure in developing countries.	
Can they be 'creatively recombined' to address each other?	Yes (How?) / No (Why?)	
	Older adults can become English teachers for the young students as this would give the students a chance to practice their english speaking skills with native speakers of the language.	
What is the role of the older adult?	Receiving help / Offering help (How?)	Active Ageing
	The role of older adults is of teachers, i.e. *providers* of education.	

In the following sections we will discuss our action research based experimentation with SIFAA aimed at transforming an incremental-physical intervention into a radical-digital one whilst contributing to our understanding of radical-digital interventions as well as the use of SIFAA in their development.

Action research

Action research 'is the application of fact finding to practical problem solving with the view to improving the quality of action within it...the focus is on a specific problem in a defined context' (Burns, 1990 p. 253). Kagan, Burton and Siddiquee see it as an 'orientation to enquiry' rather than a particular research method and they argue that in its simplest form, action research aims to combine the understanding, or development of theory, with action and change (Kagan, Burton, & Siddiquee, 2007, p. p. 32). Although action research has been questioned for researchers' impartiality (Hoque, 2006), its iterative focus on reflection and action attempts to harness its *subjectively objective* position as a course to problem solving (Kock, 2004). Our research followed the five stages of action research suggested by Susman and Evered (1978) as described below.

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- <u>Diagnosing</u>: Reviewing theories of ageing and loneliness in order to identify a research gap worthy of further exploration.
- <u>Action Planning</u>: Developing SIFAA as a proposition to tackle age-related loneliness.
- <u>Action Taking</u>: Prototyping radicalisation and digitalisation of an existing intervention using SIFAA as a framework.
- <u>Evaluation</u>: Ethnographically observing the intervention in order to inform next steps in developing the intervention.
- <u>Specifying Learning</u>: Gleaning insights from the trial to help future exploration of SIFAA and radical-digital interventions.

Figure 2: Susman and Evered's five stages of action research (1978)

This cyclical process of 'thinking and doing' things differently helped us in making design choices that ensured a constant focus on *action* while always remaining grounded in our theory.

Having covered the diagnosis and action planning in the preceding segments of the paper, we will now discuss how the intervention was carried out and what our ethnographic insights mean for designers interested in developing radical-digital loneliness interventions for older adults.

The prototype

Our study was based in the Manchester area, UK. We liaised with an existing community engagement charity organisation that coordinates weekly lunch sessions in a local pub for anyone who feels socially isolated or lonely. The pub-staff, university students and charity organisers, who all volunteer on the day, serve lunch and beverages to the 'clients'. Nearly 20 clients attend these sessions every week and spend approximately 3 hours of the afternoon in the pub *catching-up* over food. With it being a local community engagement initiative, some clients happened to be neighbours, friends or acquaintances and their discussions involved a variety of topics ranging from the local news to their experiences of common medical conditions, etc. For example, 4 of the attendees have had knee replacement surgeries at the local hospital within the last year and they often discussed their experiences of having undergone the entire process.

At the time of our study, the weekly lunch sessions had been running for nearly 2 years and all the clients but two were over the age of 60 years with the oldest one being 97 years old. The youngest client had mobility, dexterity and speech difficulties and he attended these sessions, as he was prone to experiencing loneliness and to feeling socially isolated. Nearly 70 per cent of the clients were female.

This intervention (the weekly lunch sessions) provided an ideal opportunity for our experimentation in its *raw*, incremental-physical form. Due to the sensitive nature of the project, we chose an ethnographic approach where the field researcher used the participant observation technique, by working as a volunteer at the weekly lunch sessions. This allowed the researcher to establish rapport with the clients and also ensured that the research aims and objectives could be explained to the participants in detail in a comfortable environment. At the same time, we recruited 6 University-level students based in India who were interested in practicing their English speaking skills. There were 4 male and 2 female students who participated in the study. Ethnographic fieldwork was carried out during the lunch sessions over a period of 45 weeks. In order to succinctly capture and present our actions and insights from our experimentation, we have adapted Susman and Evered's (1978) model of action research below.
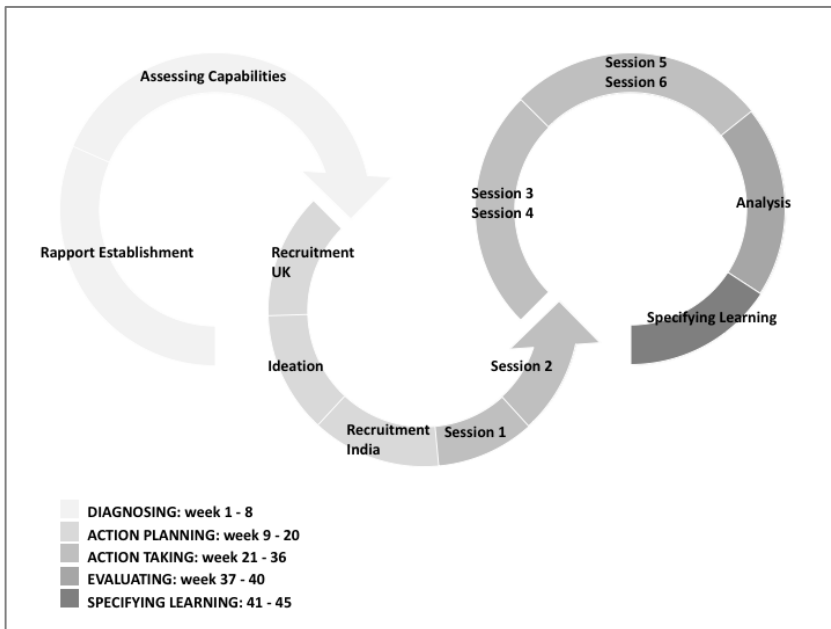
Figure 3: Implementing the prototype

Diagnosing (week 1 to 8)

We utilised this time to acclimatise ourselves to the research environment (the intervention) by volunteering at the weekly lunch sessions. This involved serving food and drinks and having informal conversations with the clients. Being 'situated' in the context (Suchman, 1987) allowed us to ethnographically observe how the intervention operated and also provided us with an invaluable opportunity to establish rapport with the clients and to introduce ourselves as well as our research aims and objectives. We also utilised this time to understand how the attendees perceived digital technologies and their varied capabilities. For example, through participant observations, we found out that one of the clients had been a computer teacher before his retirement but he was not very confident with using smartphones.

Action Planning (week 9 to 20)

Once we had *blended in* with the group, we started having discussions with individuals who expressed a desire or willingness to be involved in the

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research activity. Based on our ethnographic observations, we had noticed that a certain part of the pub was not utilised during these lunch sessions and it seemed to be reasonably quiet to have conversations. In our ideation session on how to run the intervention, we narrowed in on that *corner* of the pub as a suitable place to install our intervention. The pub had a public wireless Internet connection (Wi-Fi) that was helpful in connecting us to the Internet. We also recruited a group of adult students (University level) in India who were willing to participate in the study.

Action Taking (week 21 to 36)

This stage formed the core of our *action* research approach. We prototyped our SIFAA-based intervention over 16 weeks and carried out 6 videocalling sessions in total. We set up a mutually convenient time for both parties (older adults in the UK and students in India) and used *Skype* to connect participants in the two geographical locations. We observed these videocalling sessions ethnographically and synthesised our findings from each session to inform design choices for the next one. For example, during the first session we noticed that the older adults were having difficulty in hearing the Indian students even though the tablet computer's (*iPad*) volume was set to maximum, given the ambient noise and auditory problems. We decided to introduce earphones to resolve the issue but found out that because many older adults had hearing aids, it would not be convenient for them to use the earphones. This constant iterative loop of reflection and action allowed us to fine-tune the prototype intervention over several attempts to reach a satisfactory level. We have presented a snapshot of our ethnographic insights and how they informed our design decisions in Table 4.

Table 4:   A summary of ethnographic insights informing design choices

Session Number	Insights	Design Choices for Next Session
1	Operating touchscreen interface (iPad).	Using a stylus.
	Age-related hearing problems.	Using earphones.
	Network issues.	Finding *sweetspots* for network or a reliable cable connection.
2	Shaky camera and visibility problems.	Using the pub's advertising screen (TV) with a laptop instead of an iPad.
	Not being able to use earphones due to hearing aids.	Using TV's inbuilt speakers as they have amplification.
3	Older adults' voice was faint due to laptop (microphone) being too far.	Using an external Microphone or a longer HDMI cable.
4	Difference in time zones, too dark to see anything outdoors.	Limiting the conversations to indoor interactions.
5	Student examination time affecting student participation.	Discontinuing sessions until students are available.
6	Time zone and student availability issue.	Finding local students / volunteers interested in participating.

Evaluating (Week 37 to 40)

Our ethnographic observations conducted throughout our research project and other qualitative interactions with participants helped us in evaluating our experiment. One of our primary aims was to move from the theoretical understanding of SIFAA to its praxis through this prototype. We found that it was possible to conceive radical-digital loneliness interventions using SIFAA and that an action research approach could be used to refine the intervention further. We have presented here select quotes from 3 of our participants to indicate how the intervention was received overall.

'I'm always up for something new. It's the same reason I watch all those television quiz programs. It keeps this (points to her head) going. One needs to keep their brain occupied with new things' (Older participant 1).

This participant lived alone and expressed her willingness to participate in our study because she thought it provided her with an interesting mental stimulus. She suggested that staying mentally 'active' was key to healthy ageing.

'Technology is great now you know. We never had this when I was young and it's really lovely that we can speak to people all over (the world). That's something that we couldn't do before' (Older participant 2).

This participant felt really positive about the use of videocalling and the possibilities that it opens up. She saw it as playing a crucial part in connecting people, which is essential to mitigating loneliness.

'I was enjoying the sessions but I had to opt out because it wasn't really convenient for me due to the timings and my University schedule' (Student participant 1).

This participant suggested that even though he liked the core idea, it was not sustainable for him. Conflicting time zones and his daily routine meant that he had to discontinue participating in the sessions.

The intervention was generally received well by participants both in the UK as well as India. However, out of the 6 Indian students, 4 had to drop out. 2 out of these 4 students cited their University commitments for discontinuing their participation in the intervention. Contact could not be established with the remaining 2 students to ascertain their reason(s) for dropping out. In the UK, most participants seemed to be engaged in the sessions. For instance, one respondent who suggested that he was 'not into technology' was very active in the videocalling sessions and asked the students several questions about various sports they played. Another 2 respondents, who did not ask any questions when provided with an

opportunity to do so, were later discussing amongst themselves how they enjoyed witnessing another 'culture' live on the screen. In our penultimate session, older participants recognised the student on the screen and addressed him by his name. Even the student was able to recall a few names. They also shared jokes with each other with one participant asking a student if they have had a 'break-in' indicating that the student should tidy up their room, to which the student laughed.

It is noteworthy that each design decision that we made was based on our participant observations and over 6 iterations the intervention had undergone a notable change in the way it operated previously. For example, towards the end of the 16th week, some older adults remarked that they really liked the idea of videocalling and were interested in keeping in touch with their friends and family over the Internet having seen how it works. The few older adults who had learned how to use videocalling software started showing others how to use the software. Maybe in future participants (older adults and students) could use our template (Table 3) to make their own design choices in order to adapt the intervention to meet their requirements.

Specifying Learning

Our trial suggests that SIFAA can be used to think radically differently about loneliness interventions for older adults. We found it useful to develop and to use a template (Table 2) to score all our loneliness ideas on to successfully experiment with, and implement an intervention based on SIFAA. Our study also showed that existing interventions could be given a radical-digital makeover using SIFAA as a designing principle.

With regards to the specific learning from our prototype, we found Susman and Evered's five stages of action research (1978) extremely helpful in ensuring that we were constantly 'thinking and doing' things differently. Overall the intervention was well received and many design issues were addressed over several iterations however, we found that operating in different time zones presented a challenging management problem. For example, the weekly lunch sessions were always carried out on Thursdays, 12:30pm UK time. Therefore, the students would have to be available at 6:00pm Indian time, which meant that it was too dark for them to conduct the session outdoors. One way to circumvent this problem in future research could be to recruit local students or other parties who could

receive some form of support from older adults. Perhaps in future even local or global volunteering and befriending could be done digitally?

Additionally, though our research demonstrates that we were successful in developing and trialling out a SIFAA-based intervention, further research and experimentation is needed to refine this approach. For instance, it remains to be seen if SIFAA can be used to create completely new radical-digital interventions, rather than only being useful in transforming existing interventions. It is also important to acknowledge that our intervention may not have been able to demonstrate suitably replacing older participants' 'lost roles' in society. However, our older participants expressed a desire to help the students when briefed about the project and agreed to participate in the study. This indicated their willingness (if not the need) to assume the 'role' of an educator by practicing what comes naturally to them – speaking English.

A key strength of this project was also one of its key limiting factors i.e., the participatory nature of the researcher. The older adults were constantly relying on the researcher to set up the videocalling sessions and for troubleshooting. Towards the last couple of sessions, the older participants did not interact with the laptop at all. They were only interested in speaking to the students by holding the microphone and would defer to the researcher for any interaction that was needed with the software. Although this was the case during our experiment, one of findings was that a facilitator (replacing the researcher) is essential to progressing such an idea. Perhaps with further design iterations the facilitation process could either be made virtual or even designed out. Also due to limited resources, it was not possible to conduct ethnographic observations in India. We relied on conversations with the students to gather information about the intervention and their experience of participating in it.

Discussion and conclusion

In this paper we have reviewed the on going discourse on ageing in the backdrop of global demographic trends indicating that an unprecedented number of world's total population is now reaching retirement age. This means that just under a quarter of the world's total population will be over the age of 60 years in the next three and a half decades and therefore the number of older adults experiencing loneliness will also increase. We have contextualised the problem by reviewing recent research in mitigating

loneliness and have suggested a novel approach to designing loneliness interventions for older adults.

Through our review of radical-digital interventions, we have developed a theoretical model that combines activity theory and social innovation. We call it Social Innovation for Active Ageing (SIFAA). We argue that because social innovation is inherently 'collaborative' in nature, it can negate Activity Theory of Ageing's (ATA) focus on the individual as its unit of analysis. We also suggest that by doing this, new roles can be conceived for older adults to replace the roles that they may have lost in time as suggested by the ATA. We have described the tools and techniques that we designed to *operationalise* our SIFAA-based intervention using an action research approach. We have also presented our findings from the empirical testing that indicate that SIFAA can help designers conceive radical (if not radical-digital) loneliness interventions. The contributions of this paper are two-fold, i.e. theoretical and practical. Our theoretical manoeuvre advances the literature on activity theory of ageing and social innovation by demonstrating how they can complement each other in the area of healthcare. On a practical level on the other hand, we demonstrate how SIFAA can be adapted to conceive loneliness interventions and the various challenges and opportunities it presents to the designer.

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