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Creativity Support for Learning in the Person-Centred Care of Older People with Dementia

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Abstract. We are exploring mechanisms to enhance the person-centred care of older people with dementia with tailored creative thinking and reflective learning techniques. In this paper we report a new tablet-based app to support carers and older people to reminisce, think creatively and learn through reflection. Creativity support is offered though a service that implements the creativity triggers technique adapted to a model of person-centered dementia care.

Keywords: Dementia care, creativity triggers, digital life history, values.

Dementia Care and Creativity

Dementia is a condition related to ageing. After the age of 65 the proportion of people with dementia doubles for every 5 years of age so that one fifth of people over the age of 85 are affected. Care is often delivered in residential homes. for example, 4 in 5 of all home residents in the UK have some form of dementia (e.g. Triggle 2013). One paradigm for the care of people in these homes is person-centered, which seeks an individualized approach that recognizes the uniqueness of each resident and understanding the world from the perspective of the person with dementia (Brooker 2007). It can offer an important role for creative problem solving that produce novel and useful outcomes (Sternberg 1999), i.e. care activities that both recognize a sense of uniqueness and are new to the care of the resident and/or care staff. However, in spite of some recent advances [Zachos et al. 2013], there is little explicit use of creative problem solving in dementia care with and without technical support.

The Digital Life History App

The Digital Life History app is a new app developed to support reminiscence, creative thinking and reflective learning within the person-centered care approach. Currently, carers in residential homes use life storybooks to develop an understanding of each resident's needs based on understanding their past. These storybooks are often physical scrapbooks containing important information about a resident's life such as their marriage, family and vocation, as well as about their day-to-day care needs and life

preferences. They are normally developed through collaborations with the resident, their family carers and wider family to record aspects of their past and present lives. They typically contain stories about a resident's life, activities that the resident enjoys, and daily preferences. Carers often use such storybooks to learn about residents with early stage dementia to maintain the resident's personal identity, identify personal strengths, reveal coping strategies, maintain conversational skills, process past conflicts and issues, explore change and loss, influence future care, and express personal feelings. However, most storybooks are physical, and hence static artifacts that do not utilize capabilities that digital technology can offer.

Therefore, we have developed the *digital life history* app to support reminiscence sessions where carers and residents reminisce about the resident's life together. It also supports family and friends to contribute to the stories, photos and other information using the web-based *digital life history* manager. The *digital life history* app has been implemented using Sencha Touch 2.0, a high-performance HTML5 mobile app platform that is platform independent and allows the app to run on devices that include iPads, and smartphones as well as desktop and laptop computers. Carers and residents can access up-to-date content about the resident during care activities using the tablet-oriented app. The content is presented as read-only using forms of interaction that are designed to replicate the use of physical storybooks used in residential homes. These forms of interaction include shared use of the app by a carer and resident together to encourage the resident to reminisce, communicate and share their memories and experiences with the carer, and single use of the app by the carer to support creative thinking and reflective learning about the resident within established person-centered care practices. Figure 1 shows the app's presentation of life stories for one resident that can be used with both forms of interaction.

Figure 1. The digital life history app, showing one resident's basic details, key relatives and favorite memories pages

Moreover, the app provides explicit creativity support with which to personalize care to each resident using a new computational creativity service that combines digital content about a resident stored in the life history with the *creativity triggers* technique. Creativity triggers were developed to provoke stakeholder-led creativity of new ideas for software systems. Each trigger identifies a desirable quality of a future product or system, and provides simple guidelines to encourage stakeholders to discover new ideas that might deliver that quality. In this work we adapted the technique to

trigger idea generation leading to desirable qualities of good person-centered care extracted the established *My Home Life* approach (http://myhomelife.org.uk), which identifies 8 good practice themes for dementia care: *maintaining identity*; *creating community*; *sharing decision making*; *managing transitions*; *improving health and healthcare*; *supporting good end of life*; *keeping the workforce fit for purpose*, and; *promoting positive culture*. We adapted values emerging from some of these themes to generate a first set of 13 parameterized creativity triggers reported in Table 1. Each trigger is instantiated with concrete information about the resident and their personal activities and objects. For example, the second trigger to generate ideas to rekindle interests was generated using the theme of maintaining a resident's identity.

1.	Consider how to replicate how [resident] [activity] in the home
2.	Consider how to rekindle an interest in how [resident] [activity or object]
3.	Consider how to trigger reminiscences about the [object]
4.	Consider a new way for [resident] to [activity]
5.	Consider a new way to provide information to [resident] about [object]
6.	Consider how to provide more information about [object] in [video/image/audio] form
7.	Think about how to use knowledge about [object] to increase the trust [resident] has in your care
8.	Consider how to enhance a sense of security using information about [object]
9.	Consider how to maintain a sense of continuity with activities such as when [resident][activity]
10.	Consider how to encourage sense of belonging with activities such as when [resident] [activity]
11.	Consider how to give [resident] a sense of purpose with activities such as when [resident][activity]
12.	Consider how to give [resident] a sense of fulfillment such as when s/he [activity]
13.	Consider how to give [resident] a sense of significance

Table 1: The parameterized creativity triggers of the creative idea generation service

To generate prompts personalized to each resident, the computational service processes natural language text from the digital life history record. It parses natural language content describing each resident to extract (1) *objects* in the forms of nouns and proper place names; and (2) *activities* in the form of verb phrases determining the active verbs and all text through to the next punctuation/conjunction word. A typical description of a resident's preferred day-to-day activities might be:

I used to make evening meals for the family and I still like to feel useful around dinner time. Even if it's just helping to set the tables. Then I like to sit down and watch a bit of telly and maybe do some knitting. Before bed I like to read a book. I usually go to bed at 10pm and read in bed.

The service first splits the text into sentences, then a part-of-speech tagging process is applied that marks up the words in each sentence as corresponding to a particular lexical category (part-of-speech), based on both its definition, as well as its context. In the third step the algorithm applies a natural language processing technique called *shallow parsing* that attempts to provide some machine understanding of the structure of a sentence without parsing it fully into a parsed tree form. The output is a division of the text's sentences into a series of words that, together, constitute a grammatical unit. In the fourth step, to determine objects, the algorithm applies lexical extraction

heuristics on a syntax structure rule-tagged sentence to extract content words relevant for the generation of one or more objects. Using this 4-step process the service returns a set of objects and activities. Returning to our example, the service returns the following objects: *evening meals; family; dinner time; tables; telly; bed; book,* and activities: *make evening meals; feel useful around dinner time; helping to set the tables; sit down; watch a bit of telly; do some knitting; read a book; go to bed at 10pm; read in bed.* The service uses these identified objects and activities to automatically generate creativity triggers for a resident called Doris such as:

- *Consider how to enhance a sense of security using information about dinner time;*
- *Consider how to maintain a sense of continuity with activities such as when Doris make evening meals.*

Creative Thinking and Reflective Learning

The new *digital life history* app supports our model of creative problem solving activities in care work [Zachos et al. 2013]. The model describes activities that carers should undertake, the ordering of these activities, and the knowledge consumed and generated by carers during the activities. In contrast to traditional creativity processes, our model assumes that ideas are generated and implemented concurrently by different carers. The normal sequence of idea incubation then generation in established creative processes is reversed due to a lack of time for upfront idea incubation. Instead, idea generation happens in one or more periods of accelerated idea discovery. Idea incubation is replaced by longer periods of reflection during which carers learn about, evolve and select between ideas. This reflection can lead to idea combination and refinement that can then be implemented as changes to the care of a resident that can be verified in practice and reflected upon further.

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