Chapter 12
What’s Memory All About?
The Importance of Memory in Alzheimer’s Patients

Aníbal Caixinha
Instituto Universitário de Lisboa (ISCTE-IUL) e Instituto de Telecomunicações, Portugal

Isabel Machado Alexandre
Instituto Universitário de Lisboa (ISCTE-IUL) e Instituto de Telecomunicações, Portugal

ABSTRACT

Dementia is, unfortunately, a well-known problem of nowadays, product of a set of generational transformations and a result of better life conditions. There are different kinds of dementia but Alzheimer is the one with predominance. Memory is the key factor in this type of illness and it is nuclear to understand how it is constructed to hypothesise and try to determine how it degenerates. In this chapter, memory structures are presented as a starting point of the research and then through the use of narrative intelligence we devise a method to present small excerpts of patient’s history and simultaneously illness progression is evaluated. To do this, a small prototype of MEM+ has been developed, and for its development a participatory design was conducted. With this approach, we aim to devise the right application to be used by the patients themselves and by their caregivers. During this stage of the project special attention was paid to usability issues, and some adaptations made to better the human computer interaction.

INTRODUCTION

The Alzheimer disease is a type of dementia which causes a global, progressive and irreversible deterioration of the several cognitive functions (memory, attention, concentration, language, and reasoning, among others). This deterioration has some consequences such as changes in behaviour, character, and functional capability of the patient, making it difficult to complete its daily routine (Alzheimer Association, 2012). Currently Alzheimer already affects 7.3 million people only in Europe, by this century’s midpoint, global demographic changes will double or even triple the number of people over age 65 in many countries, also increasing the numbers of the disease, causing therefore a major social and medical problem. Worldwide the number of people with dementia

DOI: 10.4018/978-1-4666-8828-5.ch012
is estimated by 44.4 million people. This number will increase to an estimated 75.6 million in 2030, and 135.5 million in 2050 (Alzheimer’s Disease International, 2014) - see Figure 1.

The initial symptoms of the disease include loss of memory, spatial and time disorientation, confusion, reasoning and thinking problems. These symptoms become increasingly worse as the brain cells continue to die and their inter-connections alters. To help Alzheimer’s patients it is important to understand how memory is structured and how it stores the information gathered during lifetime.

To date, no cure was found to Alzheimer disease. However, there are some medicines that allow the symptomatic treatment of most of the cognitive and behavioural changes. Although, they cannot avoid the progressive neurological loss, the existent medicines can help to stabilize and minimize some symptoms. Nevertheless, Alzheimer disease curing should gather the pharmacological and non-pharmacological interventions.

The non-pharmacological ones, belongs to a group of interventions that strive to maximize the cognitive function and person well-being, as well as helping her/him in the process of the disease adaption. The activities developed try to stimulate people’s capabilities, preserving, most of the time, their autonomy, comfort and dignity.

Taking these findings into consideration, the work here presented aims at maximizing the patient cognitive functioning, by exercising his/her memory. The application, called MEM+ - for MEMory+, presupposes that the patient lays on an initial or intermediate stage of the disease, where he/she can still walk, recognise people and can associate words to objects and colours. MEM+ is being developed with the aid of specialised technicians and professionals, mainly from the Portuguese Alzheimer Association. In this chapter, we discuss the importance of memory formation and the need for a participatory design during the specification and development of the project, and simultaneously a small prototype is presented as well as the requirements and rationale behind its conception. Finally some future research directions are identified and some conclusions are drawn.

**BACKGROUND**

Memory is the vehicle that allow us – humans – to construct our story over the years. Singer (2004) concluded that identity formation was based on the generation of narratives from lived experience. Singer et al. (2013) proposed a model of narrative identity which identifies a dual memory system that generates autobiographical memories and self-defining memories (see Figure 2).

From this model, it is possible to understand that the dual memory system generates autobiographical and self-defining memories. The episodic memory system works with the actual memories and evaluates them in order to understand if they are valuable enough to belong the long-term self-memories.

The life-story memories reveal memories that are important to the self during a particular life-period following Thomsen et al. (2012), being linked to long-term goal pursuits, and are more affectively intense, important and detailed than other less important autobiographical memories.

One could ask if these life-story memories will be constituents and central to the narrative identity. In our research context, one could also ask if these memories are the ones that keep being remembered or if these are the ones that disappear?

Following Singer and colleagues (2013), similar to life-story memories, self-defining memories are vivid, affectively intense and well-rehearsed. They build on life-story memories by connecting to other significant memories across lifetime periods that share their themes and narrative sequences. They reflect individuals’ most enduring concerns (e.g. achievements, etc.) and/or unresolved conflicts (sibling rivalry, addictive tendencies, etc.). Are these self-defining memories persistent in our memories our do they tend to go away?