Chapter 9
Do You Remember, or Have You Forgotten?

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ABSTRACT
Dementia is, unfortunately, a well-known problem and a product of a set of generational transformations as a result of better life conditions. Since we cannot eradicate this problem, we can try to develop means to minimize the effects. Alzheimer disease is one type of dementia that affects 7.3 million people in Europe. Alzheimer does not only affect the person who is ill but also their families and friends at different levels, such as personal, emotional, social, and financial. In this chapter, the authors present an interactive application that, based on a narrative retrospective of the patient’s life, tries to fight the evolution of the disease and maximize the patient’s cognitive function. With this, the authors aim to minimize the effects of the illness and improve the life not only of the patient but also of his/her caregivers and family.

INTRODUCTION
The Alzheimer disease is a type of dementia that causes a global, progressive, and irreversible deterioration of the several cognitive functions (memory, attention, concentration, language, thinking, 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).

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 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 belong 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. By acquiring information about the history of the patient, it is possible to generate a set of questionnaires that aim to identify if the patient maintained his/her level of awareness or if there was a deterioration of the previous cognitive condition.

After the questionnaire, the patient is presented with a short narrative that links the facts that were not recalled. By presenting such story—like an auto-biographic story—it aims not to explicitly tell the patient that he/she has lost some memories but try to elicit the possibility of bringing them to mind.

In this context, we focus this chapter on explaining the rationale of the application, arranged in this format: section 2 describes the context and related research, section 3 the application itself, going into details of conceptualisation and operation. Section 4 details the test conducted, and finally some future research directions are identified and some conclusions are drawn.

**BACKGROUND**

Stories have always been part of human culture, and although civilization has passed through several changes (cultural, evolutionary, etc.), they remain inside and around us. Each of us is capable of telling a story about his/her own life, each of us stores in his/her memory what happens in the world in the format of stories, and each of us uses stories to understand not only what surrounds us, but also what our role is in such a big play. And what if some day we wake up and such memories, parts of our stories are gone?

This evidence was the major drive for the development of this project, and in particular of the application MEM++, because if someone has lost the ability to remember some important moments of his/her life, there is the chance that by being presented with a story that tells presents such events, the memories may came back. But how relevant is this for Alzheimer’s patients?

Alzheimer’s disease is the most frequent form of dementia in elderly people (Otto *et al.*, 1998) and for the time being no cure was found. Based on this, we centred our research on a non-pharmacological approach, which has already given some indications of being potentially beneficial for patients (Douglas *et al.*, 2004; Tárraga *et al.*, 2006). In (Tárraga *et al.*, 2006) a randomized pilot study was conducted to assess the efficacy of an interactive, multimedia tool of cognitive stimulation in Alzheimer’s disease. The multimedia tool allowed the patients to exercise their memory, attention focus and recognition of activities and emotions (Smart Brain, 2012). In this pilot study, the patients that underwent the multimedia tool also received a pharmacological treatment. The results showed some improvements in their cognitive achievements but because of the multitude of variables involved in the study, the authors could not tell explicitly if they would come only from the use of the multimedia application.