

## Design of an iPad cover for people with cognitive impairment

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A.L. Cordia. *Design of an iPad cover for people with cognitive impairment*. *Gerontechnology* 2015;13(4):432-433; doi:10.4017/gt.2015.13.4.010.00 Playing games on touch screen consoles, such as the iPad, have the potential to enrich the choice of individual activities. A dedicated iPad cover is necessary for enabling people with dementia to engage themselves with iPad games. This cover should not disrupt the interaction between the user and the iPad game and should therefore be designed according to the demands of the stakeholders. This paper reports the design implications of an iPad cover concept branded the 'Proud to Play' for allowing people with dementia to play games safely and joyfully.

**Keywords:** design, dementia, games, touch, valorisation, Design for Lean Six Sigma

Dementia is a syndrome that results in deterioration in cognitive function<sup>1</sup> and affects women more than men<sup>2</sup>. The impairment in cognitive function is not only affecting the client's system but also their social environment for fulfilling their caring needs. In the Netherlands 80.000 people with dementia<sup>3</sup> live in nursing homes. In dementia care options for daily activities are limited and often aimed at group interaction.

Clients sometimes prefer a separate, individual activity as alternative to group activities. Playing games on touch screen consoles, such as iPad, have the potential to enrich the choice of individual activities. We report the design of an iPad cover branded 'Proud to Play' for allowing people with dementia to play games safely and joyfully. The cover has been developed according to the Design for Lean Six Sigma<sup>4</sup> methodology in an iterative designing process for full stakeholder satisfaction. Only design and development considerations will be dealt with here.

### THE CALL

The three larger care organizations in Rotterdam (Aafje, Laurens and Humanitas) recognized the potential of touch screen consoles in their day activity programs for people with dementia and invited the Research Centre Innovations in Care of the Rotterdam University of Applied Science to set up a project. The international 'In Touch' research consortium was initiated to meet their request for exploring the impact of one-player iPad happy games on the wellbeing and behavior of people with dementia as well as studying the factors that influence the use of one-player iPad games in dementia care.

In the research project observations of people with dementia playing happy games were included. The aim of the observations was to quantify if people with dementia had a positive change in mood after the game (results to be included in a future publication). Before the obser-

ations could start, an iPad cover was necessary for enabling people with dementia to engage themselves happily with iPad games. This cover should not disrupt the interaction between the user and the iPad game and should therefore be:

- Safe for the player and the iPad;
- Stable whether using the iPad horizontally or vertically on a table or on one's lap;
- Joyful by covering the physical buttons of the iPad for avoiding accidentally shutting down an app prematurely;
- Desirable with a stylish and elegant design and perfectly functional.

### THE DESIGNING PROCESS

The design and the development of the manufactured product was realised in four phases. These were: (i) concept design, (ii) engineering phase for prototyping, (iii) testing and evaluation of the handmade silicone rubber prototypes and (iv) translation of the design in EVA foam (same material as the well known Crocs™ shoes) for manufacturing. In all phases the interaction with the target group and caregivers was prominent to complete a definite set of demands. This demand set for the iPad cover design aimed at the following aspects:

- (a) Needs and stimuli of people with dementia in relation to playing games;
- (b) Needs of caregivers and relatives for providing the games;
- (c) Safety and protection of the iPad;
- (d) Manufacturing, costs, distribution and promotion of the cover.

In the first phase (i) several designs were tested in practice with the target group before the final concept was chosen for further development and prototyping. The chosen concept design was a mono-form in a flexible material that could be put firm on a table vertically and horizontally and would not slide away from one's lap. The flexible material made it possible to mould the cover in

# iPad cover for cognitive impairment



Figure 1: Joyful playing iPad games with dedicated cover (a, b), with front view (c) and back view (d) of an iPad with cover 'Proud to Play'

one production step without release problems for the extensions covering up the buttons.

In the engineering phase (ii) the chosen design concept was upgraded to a manufacturing model as basis for producing ten handmade silicone rubber prototypes that could be used in daily activity programs.

During the testing phase (iii) the functional performance of the handmade covers was evaluated and qualitative interviews with professional caregivers for registering their experience during the observations were held. In this phase we received amongst others information about colour preferences of the target group, the way of operation by the professionals and that a lighter version was preferable to improve its utility. A side effect was that the professional caregivers valued the dedicated designed cover as a positive contribution to the playing pleasure of the target group and were motivating us to manufacture this iPad cover for a wider public, because they

believed that the current heavy-duty covers in the market would not be that effective.

The last phase (iv) aimed at the adjustment of the design to the EVA foam manufacturing constraints and to enhance its functionality for the operation of buttons for caregivers and a wider target group. The choice of EVA foam as manufacturing material was based on the properties of anti slip, anti bacterial, elasticity, lightweight, durability, temperature and chemical resistance, chock absorbency and that it ricochets dirt and moisture. Changing the production material to EVA foam would make the design 70% lighter and would match the last mentioned requirement of the professional caregivers.

## VALORISATION

A manufacturer was found with expertise in EVA foam iPad covers for children at school. He was charmed of its concept and convinced that it could be used for other target groups as well. We decided to adjust the manufacturing model with improved operation possibilities to meet the demands of seniors and children for more autonomy in using the iPad, while still hiding the hardware buttons for people with dementia (Figure 1).

The iPad cover has been branded 'Proud to Play' because it enhances the potential of people with cognitive impairment to play happy games individually for more self-esteem and fun. Any royalties will be used for further development of happy games for the growing population of people with dementia and the development of tools for predicting a match between an iPad game and the interest and abilities of people with dementia. The cover can be obtained at [www.proud-to-play.com](http://www.proud-to-play.com).

## Acknowledgements

Funding was obtained from SIA RAAK, the Netherlands. The 'In Touch' consortium consists of Rotterdam University of Applied Science, Utrecht University of Applied Science, University of Sheffield, DAZ, Laurens, Aafje and Humanitas. The 'Proud' branding stands for 'Powered by Rotterdam University of Applied Sciences Design' and the 'to Play' addition points at developments for enabling people with cognitive impairment to play happy games safely and joyfully.

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