



# DESIGN4 HEALTH

Extract of the  
**Proceedings of the 3rd European  
Conference on Design4Health**  
**Sheffield 13-16th July 2015**

Editor: Kirsty Christer

ISBN: 978-1-84387-385-3

## **A Set of Social Games for Senior Citizens with Dementia / D9**

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### **Abstract**

*This paper presents a project in which we designed activities with and for senior citizens who show signs of dementia. Since the condition of dementia places a heavy burden on the families and environment of affected people, our project addresses both parties: people with dementia as well as their caregivers in adult day-care centres and/or at home. The project focuses on stimulating social interaction and cognitive activities. Using the tools and methods from service and information design, we initiated a collaborative process between designers, people with dementia, caregivers, doctors, and therapists. Drawing on the extensive available research, we investigated materials and combinations of approaches that would also stimulate the senses: sight, touch, hearing, and smell. We field-tested various versions and difficulty levels of the games. We developed unique sets of social activities and developed written instructions for users. Visual topics were selected on the basis of ethnographic research and recognition levels. Graphic and stylistic variations were thoroughly tested in order to establish guiding principles for the building of an image bank. We also designed, produced, and tested a 3D working prototype. Due to the excellent responses of people with dementia to digital media, the project is now being upgraded into an app supported by a digital database of visual materials and other services.*

**Keywords:** service design, information design, dementia, social engagement, interaction, collaborative process

In a small room in the Papilot Institute for senior citizens, a group of people gather around a large dining room table: ten visitors from Roza's Garden, which offers daily care for seniors and people with dementia, an occupational therapist named Nina who is smiling from ear to ear, and four (slightly nervous) students of design along with their mentors. Or more precisely, their mentors, the authors of this paper, squeeze into a corner of the room and observe the unfolding events with keen interest. After more than a month of research, observation, and socializing with people with dementia, the students are presenting the first working model of a multi-level social activity that, after another two years of intensive work, will become *A Set of Social Games for Senior Citizens with Dementia / D9* (referred to in this paper as Project D9).

What we witnessed in those first hours of exploration might best be characterized as a roller coaster ride, but in the most positive sense of those words. Namely: a lot of sincere joy, singing, teasing, inventiveness, helping friends, even flirting at times, telling stories about younger days, moments of painful silence when the sought-after word just wouldn't come, and the extraordinary satisfaction when a task was successfully completed (also on the part of the students). This was a range of emotions we hadn't experienced in a long time. In addition to the emotional charge and the confirmation that such exercises are necessary and will require an investment of intense professional creativity, we also received in that single hour an overview of just how demanding was the task that we had set for ourselves.

We saw in the ten visitors from Roza's Garden ten different faces of dementia. But it also became clear that, in the design of the games and activities, it would be necessary to consider both sides of the coin: people with dementia on one side, but also, and equally importantly, the therapists and family members that we wanted to be actively engaged in the activities as well. What was crucial from the beginning was the realization that there are no right or wrong answers in the game: for example, consider the situation when a player sees his first dog on a card that actually features a photograph of a horse, and this triggers the narration of stories about his youth. What at first appeared to be a wrong answer achieved more than if the person with dementia had correctly identified a horse in the photograph. Furthermore, as Aleš Kogoj, M.D., Associate Professor of Psychiatry at the University of Ljubljana – one of the top Slovenian geronto-psychiatrists and, sadly, now deceased pioneer of research and treatment of people with dementia – explained to us at a later meeting: if the activity brings a measure of calm and good feeling to individuals with dementia, then we have already achieved an enormous amount, even if some participants remain quiet throughout the course of the activity.

## Background of Project D9

Project D9 developed in three main phases. In the first phase, which took place during the 2012/2013 academic year, the authors, lecturers in the theory of design at the Ljubljana Academy of Fine Arts and Design (hereafter referred to as ALUO), offered second and third years students in visual communication design, industrial design and applied arts the opportunity to enrol in a

volunteer educational-experimental program entitled *Designing an Agenda, or, How to Avoid Solving Problems That Aren't*.<sup>1</sup> The goal of the project was to acquaint students with the basic methodology and tools of service and information design through practical fieldwork and obligatory collaboration with stakeholders. The students were allowed to choose any project in the field of health care or sustainable transport.

The second phase of the program was an international creative camp. On the basis of the results of the student's research-experiment seminars, the projects of workshop participants in both health care and sustainable transport were reassessed by the mentors and redesigned, developed, or shifted in a different direction if necessary. All the various stakeholders actively collaborated in this phase of the project: end users, experts in the field, and numerous professionals from the creative industries.

After seven months of research and development, the projects that had gone through both phases were presented at an exhibition and in a book that included the details of each project (Černe Oven and Predan, 2013). Among the presented works, the D9 Project stood out. On the basis of the extremely positive response of users, both people with dementia and their caregivers, as well as encouragement from the professional public, the Regional Development Agency of the Ljubljana Urban Region decided to continue financing the project. In this way, D9 entered the third (pilot) phase. A group of professional designers and several institutions that deal with people with dementia joined the original team.<sup>2</sup>

## Choice of Theme and Placement of Project D9 in the Wider Context

According to data from Alzheimer's Disease International (2015), 44.4 million people worldwide suffered from some form of dementia in 2013. It is predicted that this number will grow to 75.6 million by 2030, and could be as high as 135.5 million by 2050. The data also indicates that in 2010 alone, health and general care for people with dementia cost roughly 604 billion dollars.

<sup>1</sup> The experimental research seminar, called Creative Camp 2013, was carried out as part of the European Union's CCAIps Project and was partially funded by the European Regional Development Fund of the European Commission. The content of the Creative Camp was prepared by the Pekinpah Association, and logistics were organized by the Regional Development Agency of the Ljubljana Urban Region (RRA LUR). The concept for *A Set of Social Games for Senior Citizens with Dementia* was developed by: Brina Fekonja, Breda Klančič, Katarina Kranjc, Gregor Makovec, Urška Preis. Mentors: dr Petra Černe Oven, dr Barbara Predan (Pekinpah, ALUO).

<sup>2</sup> The design and development team consisted of Jože Carli, Petra Černe Oven, Brina Fekonja, Breda Klančič, Katarina Kranjc, Gregor Makovec, Jure Miklavc, Barbara Predan, Urška Preis, Barbara Šušteršič, and Silva Vitez. Partners included the Ljubljana Vič-Rudnik Nursing Home – Bokalce Branch, Papilot Institute, the Fužine Nursing Home, and Aleš Kogoj, M.D., Associate Professor of Psychiatry at the University in Ljubljana, and the Regional Development Agency of the Ljubljana Urban Region (RRA LUR). Other participants included Studio Miklavc / Pekinpah Association project manager Jure Miklavc, the RRA LUR project manager Nataša Mršol, and Tina Pezdirc Nograšek, Head of RRA LUR's Creative Camp / Project Conceptualization.

Contemplating this wider context, we were confronted by the challenging question: could we, as designers, do something to improve the situation and ameliorate living conditions of people with dementia?

## Questions, Assumptions, and Objectives

As we looked for answers to the above question, we narrowed our focus and made a number of important assumptions. First we defined the problem and its solution with the understanding that dementia is not an isolated phenomenon, but is accompanied by other geriatric diseases and these can cause conditions like dementia to accelerate (Brawley, 2005). The second extremely important assumption was the following: people with dementia are not solitary patients. The disease places a heavy burden on family caregivers as well as on the immediate and wider surroundings (WHO, 2012; Snyman, 2013).

Taking into account the wider statistical context, the assumptions defined above, and the first results of observations and testing in the field, we decided to focus our project on the search for solutions that would address the two groups of identified stakeholders: both caregivers and people with dementia in nursing homes and adult day care centres as well as at home. Our main emphasis was on social engagement and meaningful interaction. We also operated on the conclusion that the stimulation of cognitive activities is not only beneficial for daily routines and mental function, but also to some extent delays the advancement of the illness.

During our work on the project, we came to the realization that professional caregivers as well as family members find it difficult to come up with ideas and practical solutions on how to spend quality time with people with dementia. The field of mental/cognitive games tends to focus on building the agility of memory, whereas we wanted to bring in the social and personal dimension. At the same time, we undertook the expansion and development of the first model through a collaborative process, researching ways to design activities that would be interesting to both parties: caretakers and people with dementia. The principle intention was to motivate all users of the designed set of activities. To this end, we tried to design activities that were founded on asymmetrical difficulty levels.

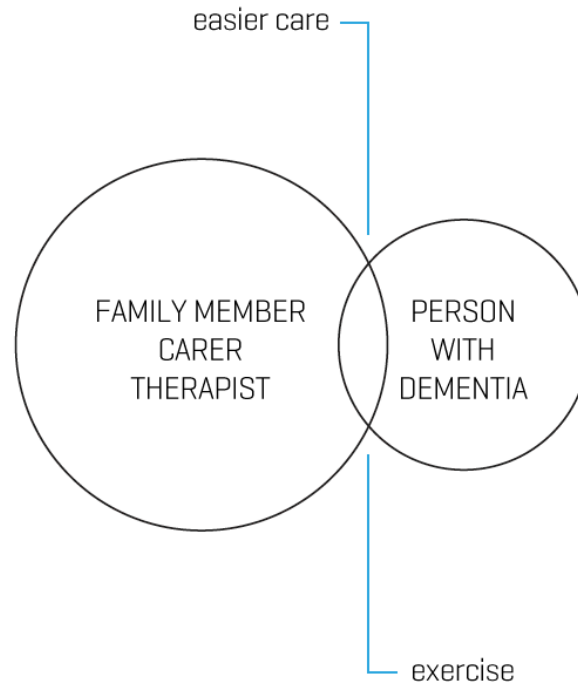


Figure 1: Asymmetrical difficulty levels of the game: easier for people with dementia, more difficult for caregivers

## Practical Steps in Service and Information Design

The research process in the development of Project D9 was based on methodology and tools used in service and information design (Černe Oven and Predan, 2013, pp. 126-175). In practice, this includes the following elements: intensive observation, active collaboration with stakeholders, numerous iterations on the basis of testing in practice, and the ongoing study of the theme through a wide selection of secondary literature.

In the first stages, for example, we were interested in the following: forms, gradations, and manifestations of the condition of dementia as well as ways it is diagnosed, how institutional care is organized, what tools are used in treatment, and what a typical day looks like for the affected person, his or her family, and professional therapists. The research phase included meetings and interviews with people with dementia, their families, and caregivers.

The crucial findings from initial field research was that professional therapists and family members spend an enormous time with people suffering from dementia, but the exercises they do mostly involve verbal tasks or handicrafts. This is despite the fact that the secondary literature suggests that people with dementia can also be stimulated with the help of other senses: scent, touch,

hearing, and visual triggers (Brawley, 2005; Jones, 2012). This suggestion was confirmed by anecdotes from the field. For example, at the Papilot Institute, therapists were constantly forced to answer the same question: "Excuse me, where is the bathroom?" First, they responded by painting big letters on the door: WC (water closet). When that didn't do the trick, they used an obvious pictogram, but found that that also didn't help people with dementia remember where to find the toilet. Only when they painted the door bright green did the question finally stop.

As a result, we decided to link verbal tasks with existing social games, to which we added new challenges that required the use of the sense triggers mentioned above. In general, the first results were positive, though we also discovered certain shortcomings in the design of the game.



Figure 2: Extensive testing process performed in collaboration with healthcare organizations and people with dementia

For example, people with dementia misinterpreted certain elements, which caused confusion during the course of the activity. The most urgently needed correction was to the visual material. The primary activity involved cards that featured various images on them (from motifs of animals, plants, career, food, and tools to images that evoked emotion). The main purpose of the cards was to trigger associations and the narration of stories.

We turned to a new study that dealt with perception and the changes in the visual perception of people affected with dementia (Vision 2020, DaSLI Group, 2013; University of Bradford, 2009). In terms of content, we relied on a questionnaire from an ethnographic research project conducted precisely to gain better insight into the chronology of the respondents' lives. It turns out that certain objects are not sufficiently recognized to trigger associations, being either too archaic or too modern. We also paid attention to presentation techniques (such as photography, illustrations,



icons, line drawings, and other styles of visual depiction of objects) and various methods of designing the visual material (contrast, the objects in relationship to the background, the number of objects in the picture, framing, colour preferences, etc.). We used the results of our research to determine guiding principles for the building of an image bank.

Parallel with the definition of the guiding principles of the project, we also began to think about various ways of playing the game and testing them in practice. We tested different levels of difficulty and looked for different ways of engaging in the activities depending on the number of participants. We also thought of ways to motivate future users to personalize the basic game set.

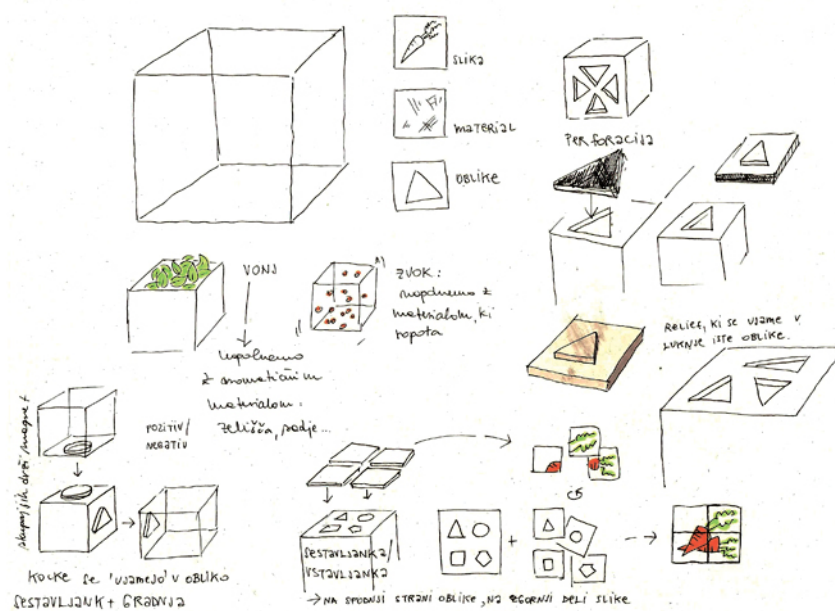


Figure 3: Design process based on thorough analysis and testing

Finally, we needed to create precise rules and write instructions for the users using plain language. In placing the instructions on the packaging, the instructions themselves became part of the activity. This was discovered during testing when we observed that even putting various elements back into the packaging of the set became part of the therapy for some users.

Only after completing the three phases described above did we tackle finding solutions for classic product design problems: ergonomics, methods for changing visual material, cleaning, handling, storage, wear on the elements, and exploring cheaper methods of production.

## Result of the Research Process



As a result of the research process and in preparation for the third pilot phase, we designed and produced a 3D working prototype that has also been successfully tested (Pekinpah, 2014). The prototype is made up of nine cubes. Each cube can be divided into three elements: four photographs/illustrations of chosen themes on four sides of the cube (in the test case, the photographs featured images representing food, objects, animals, and emotions); the second element is a cut-out of a larger photograph, which is placed on the top of each cube; the third element is the coloured bottom of the cube, each featuring a number in a different geometric shape. The cubes are hollow and it is possible to use them for storage (for example, of material that stimulates the sense of smell and touch) by removing the coloured bottom. The contents of the cube, like the surface images, can be changed and adjusted to different themes depending, for example, on the season or on specific events. In other words, the cubes are deliberately designed in a way that will encourage new variations created by inventive therapists and family members. The intention is the creation of personalized variations that will suit different individuals from different cultures.



Figure 4: Tested and approved visual material in four compatible themes

The cubes enable the users to select different levels of difficulty: from selecting individual pictures that have the simple goal of triggering associations, to more demanding combinations such as making meaningful pairs and triplets with the images, and finally more complex variations such as finding logical links three times with three triplets of images with linked content. People with dementia especially enjoyed the game in which they composed larger images from the nine cut-outs. In addition to being able to make colour variations from the coloured bottoms, it is also

possible to do simple mathematical problems and play games with the shapes (squares, triangles, and circles).



Figure 5: Completed and fully functioning prototype with various games incorporated in one solution

Very early in the process, we also tested the visual material on various tablets and, due to the excellent response of people with dementia to digital media, the project is now being upgraded into an app supported by a digital database of visual materials and other services.

## Conclusion

With *A Set of Social Games for Senior Citizens with Dementia / D9*, we tried to bridge the gap between people suffering from dementia and those who care for them. Our initial observations suggested that a well-designed activity set could be a positive tool and provide much-needed assistance to family members and professional caregivers. The activity set offers solutions that respond to the needs of both groups in an understandable, stimulating, and deliberately designed way. *The Set of Social Games for Senior Citizens with Dementia / D9* is the result of two years of collaboration with designers, people with dementia, and the therapists and family members that take care of them on a daily basis, and its success is a confirmation of the research process and the use of the tools and methods described above.

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