"ELDERPERSONAS" ADAPTING PERSONAS TO UNDERSTAND THE REAL NEEDS OF ELDERLY PEOPLE

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Abstract

The population aged 65 and above is the most diverse of the age groups. This diversity is also growing due to longer life expectancy. To provide them with the right assistive products it is crucial to understand the real needs and goals of these new groups of people. The design tools that exist to date work well when designers work with average users. Nevertheless, it is not proved that these tools are effective when working with extreme or special user groups. With this study we aim to review the existing models of "personas" and to adapt it in order to provide designers with more effective inclusive design research tools. As a result of this adaptation, we developed "elderpersonas" which includes an ethical code and a description of the aging development that are necessary to ensure the quality of the research using few resources. We preliminarily tested on the elderly population in the Basque Country by interviewing 36 people aged over 65. Based on the results, we conclude that the "elderpersonas" enabled us to better understand elderly people as well as their needs and goals. In the future the new tool will be applied on design case studies to prove its real value in practice.

Keywords: Inclusive design, Research methodologies and methods, User centred design, Elderly, Personas

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1 INTRODUCTION

It is estimated that the percentage of elderly people is estimated to increase in most developed countries by 2050 (WHO, 2016). Contrary to popular belief, the aging process begins long before the age of 65 and is accompanied with sensorial, cognitive and physical changes. In addition, the population aged 65 and over is the most diverse of the age groups and this diversity is also growing due to longer life expectancy (Jiang et al., 2016). In fact, when a person reaches retirement age they are expected to live another 25 years. This gives elderly people the opportunity to continue developing new skills and life projects if their physical and mental health allows. When independent living is not possible due to health issues, assistive technologies are needed or possibly a carer or even an institution to take care of them. In order for healthcare systems to meet the needs of a growing elderly population it is essential to enable the elderly to live independently. The providers of assistive technologies and managers of the caring systems require new tools to understand the real needs of these new groups of people. The inclusive design tools that exist to date work well when designers work with average users. Nevertheless, such tools are more difficult to apply to extreme or special user groups such as children or older people. The objective of this study is to review the different models of the Personas tool (Cooper, 1999) created by Alan Cooper in 1999 and to select the most suitable model to be adapted taking into account the characteristics of elderly people. After selecting and adapting the tool, it was tested on the elderly population in the Basque Country. Finally three Personas profiles were defined in order to describe the main groups of users to take into consideration when designing products and services for elderly people.

2 REVIEW OF PERSONAS

Other authors (Norman, 2004; Djajadiningrat et al., 2000; Dantin, 2005; Pierson et al., 2008) believe that the intuition of the designer or priori assumptions are enough to create the Personas profile, although the majority think that an ethnography of some real people is needed to evaluate it.

Alan Cooper defined the first model of the Personas tool in 1998. It served as a fictional profile of a user that would represent the patterns found in qualitative research carried out on at least 8 different people (Cooper, 1999).

(Grudin and Pruitt, 2002) proposed another version of this tool, adding to the qualitative ethnography other quantitative data from market analysis. Their objective was to define a fictional user and scenario that would be compared with real people matching the fictional user profile. The Persona profile would then be improved using the real data obtained from that qualitative comparison.

The Designing With People team (Myerson et al., 2011) provide us with ten Personas profiles that represent people with disabilities. The Personas template that they use includes aspects such as: name, age, lives in, condition, assistive aids, what I can do, what I cannot do, occupation, my condition, a typical day, good designs and how they improve my life, lessons for designers, poor designs and how they impact my life, five most "important" things in my life, message for designers. To the best of our knowledge this is the first time that user profiles have explicitly included qualitative characteristics and capabilities of users are taken into account in an explicit way.

In recent publications (Moser et al., 2012) a mix of qualitative and quantitative data was proposed depending on the knowledge a designer may have about the behaviour of the target users. If the designer does not have information about their behaviour a qualitative approach interviewing ten or twelve users is suggested. However, if the behaviour is known quantitative research (with 100 or more users) can be carried out to obtain first-hand information and to quantify it. And finally if the designer has only some knowledge of the behaviour the best approach would be a mix of qualitative and quantitative research.

Lastly, the research team from Tacsi (Tive, 2016) the Australian Centre for Social Innovation has published a report of their project Innovating Age where they described aging as a systemic event not a personal event. The aspects contained in each profile are: family, housing, income, social network, vulnerability factors, major life events and resilience factors.

2.1 Opportunity

From the review is it dear that despite there being several versions of the personas tool only two mention the kind of information that must be gathered to complete them, the rest contain only general descriptions. One of the two versions that describe that information in a more detailed way is the Australian Center for Social Innovation (Tive, 2016) in its publication about age. This author consider aging to be a matter of who you are, who your ancestors are and where and how you live. They therefore propose a systemic approach instead of the person centred one. Such an approach demands a wider and deeper ethnographic and sociological analysis. Unfortunately most design projects do not have the budgets required nor do the team have the necessary qualifications.

Designing With People is the second model that defines the information needed to describe people with any disability. In addition, the information required to complete this model can be obtained in a simple way. We think that this could be a more affordable tool for every kind of design team, but we are not certain whether it is appropriate to describe diversity among elderly people.

This research project has adapted the Personas tool to enable designers to identify the most significant data to describe and empathise with the different elderly people optimizing resources.

3 METHOD FOR THE DEFINITION OF "ELDERPERSONAS"

This paper outlines the process followed to test the tool personas with elderly people from the Basque Country. In order to do this we first selected a theoretical basis and then we describe the process followed to carry out the study.

3.1 Theoretical basis

We took the model described by Cooper (Cooper, 1999) as a basis to organize the study. To gather the information we selected the ethical code and the template for the Personas tool provided by the team Designing With People (Myerson et al., 2011). To complete that information and help interviewers we added a description of the aging process (Cavanaugh and Blanchard-Fields, 2002). The three references will be better explained below:

- Alan Cooper considers that a minimum of 8 people must be interviewed to be able to start identifying patterns of behaviour and to propose a representative fictional Persona.
- The template for the Personas Tool is exhaustive as seen in Figure 1. We selected the template and the Ethical Code from the Designing With People project. Some elements were removed (lessons for designers and messages for designers) because they did not meet the objective of this study. The ethical code is organised into five areas: *contact*, *consent*, *confidentiality*, *conduct* and *context*. It provides a guideline on how to treat the interviewees. Despite them seeming obvious we nevertheless considered it necessary to give them to the interviewers.
- An explanation of the different kinds of age was added. The types of age specified are: *biological age*, *psychological age*, *subjective age*, *social age* and *functional age* (Cavanaugh and Blanchard-Fields, 2002). These different ages are considered as the factors that determine whether a person has a successful aging (independent and socially active person), a normal aging (independent but not too active person who needs some help with daily activities) or a pathological aging (dependent person who relies on another to carry out daily activities).

This information enabled us to identify the most significant variables to describe elderly people, and compare their effectiveness (Figure 1).

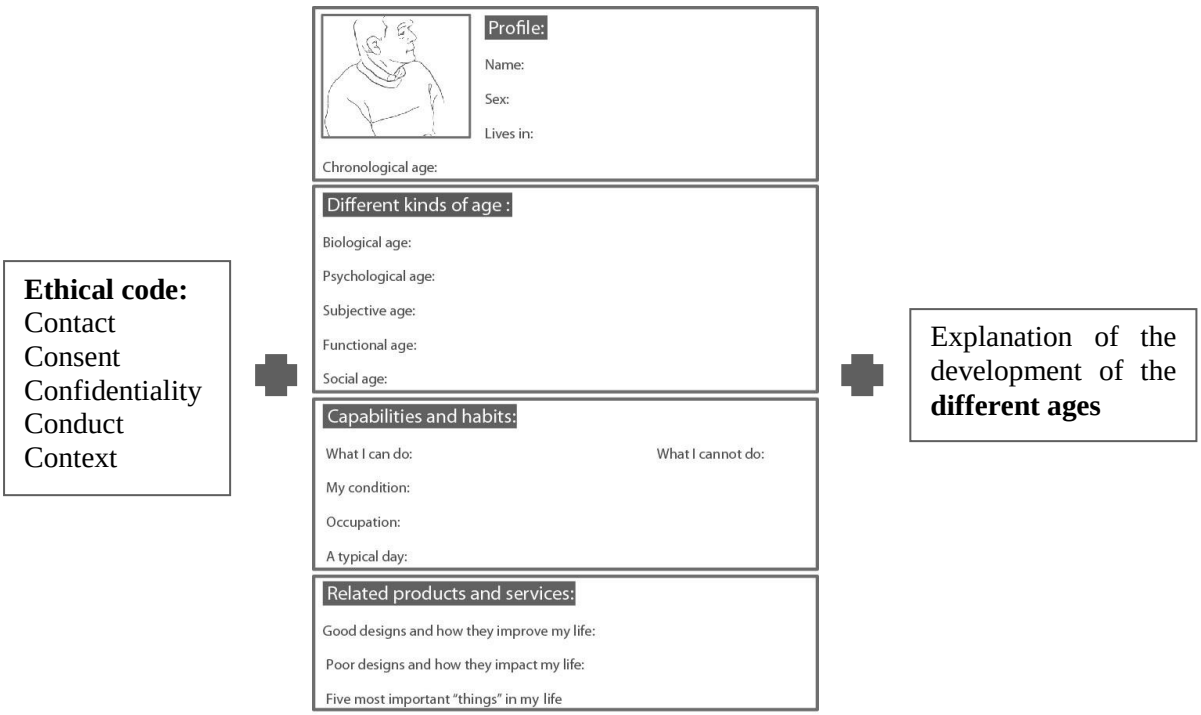

Figure 1. Material and template for the tool "elderpersonas"

3.2 Method

The objective was to interview a significant sample of elderly people aging differently to identify the existing main segments and to understand them better. The method designed for this study had six different phases:

- Creation of the team.
- Training of the team.
- Recruiting of elderly people.
- Interviews.
- Data analysis and conclusions.
- Creation of the "elderpersonas".

3.3 Application of the method

Creation of the team

After defining the method a team of 12 students was set up to conduct the interviews with the supervision of the authors of the study.

Training of the team

The students were given the ethical code, the explanation of the aging process and the template to summarize up the information gathered. The authors explained the methodology and the steps required.

Recruiting of elderly people

The 12 students were each asked to identify three people over 65 with the following criteria (Fernández-Ballesteros R., 1998):

- 1 person aging successfully (healthy and full of vitality).
- 1 person aging normally (some capability impairment related to age but living independently) .
- 1 person aging pathologically (more than one disability and need help for daily activities).

Most of them selected their grandparents or someone close to their family, this is the reason why the sample was made of people from the Basque Country.

Interviews

In the cases where the elderly person was not able to talk or give much information, we recommended that the students ask the principle carer.

The sample was large enough to be able to identify patterns. This was helped by the fact that all the students used the same variables.

4 RESULTS OF THE APPLICATION OF THE TOOL "ELDERPERSONAS"

In this section we analyse the data obtained from the application of the "elderpersonas" tool. We start with the description of the profiles, then we continue with the different kinds of age, after that we describe the information obtained about capabilities and habits, and finally the products and services which impact on them.

4.1 Profile

First the profiles are described, then the different kinds of ages outlined, the following section continues with information about capabilities and habits and finally products and services that impact elderly people lives are analysed. Table 1 shows the amount of men and women that took part in the study, their age range and the average age for each group.

Table 1. Quantitative results of the application of the tool personas among 36 elderly people in the Basque Country

Aging process	Successful	Normal	Pathological
Men/Women	8 / 4	3 / 9	3 / 9
Age range	67-86	64-89	58-95
Average age	76	81	85

The people that were identified as successful were mostly men and those identified as normal or pathological are mostly women. Other important quantitative data is the chronological age. The table shows how the range of ages selected for the successful and the normal aging were very similar but the average was slightly different. If we compare the average age between the successful and the pathological aging, the difference is greater. From this we can conclude that chronological age does not define your aging process but does have an influence, particularly over the age of 85.
The Persona profiles created from this data were Ricardo aged 76 for the successful aging, Teresa aged 81 for the normal aging and Ebelia aged 86 for the pathological aging.

Figure 2. Resulting three personas

The other ages of these Persona profiles, their capabilities, habits and the products and services related to them will be described in the following points.

4.2 Different ages

The resulting Persona profiles contain the common characteristics identified in at least half of the interviewees (at least 6).

Biological age

As shown in Table 2, most of the people identified as having aged successfully had the usual physical signs of aging: wrinkles, grey hair, hair loss, loss of vision, some loss of sharp sounds, some dentures, loss of muscle mass and slower movements. In genera however, they did not have any serious illnesses. Those aging normally in addition experienced cataracts, broken hips and risk of blood clots. Those aging pathologically often had skin ulcers, arthrosis in the joints, needed oxygen occasionally and suffered from some kind of dementia.

Table 2. Biological aging description, successful, normal and pathological processes

Biological aging process	Ricardo (Successful)	Teresa (Normal)	Ebelia (Pathological)
Skin	Wrinkles	Wrinkles	Wrinkles, ulcers
Hair	Grey hair, hair loss	Grey hair, hair loss	Grey hair, hair loss
Teeth	Some dentures	Dentures	Dentures
Visual	Some loss of vision	Cataracts, surgery	Cataracts, surgery
Muscles	Loss of muscle mass	Loss of muscle mass	Immobile
Joints	Slow movements	Broken hip, surgery	Broken hip, surgery
Blood		Risk of blood clots	Risk of blood clots
Cognitive			Some kind of dementia
Breathing system			Needs oxygen

Psychological age

Psychological age was the hardest to define due to the team being unqualified in this area. However some significant differences were identified between the three profiles in this aspect, and it is considered one of the most meaningful kinds of ages to determine whether a person is aging successfully or not.

Table 3. Psychological aging description for successful, normal and pathological processes

Psychological aging process	Ricardo (Successful)	Teresa (Normal)	Ebelia (Pathological)
General feeling	Happy	Happy	Tired and depressed
Motivation	Very motivated	Motivated occasionally	Disorientated and demotivated
Social network	Family and friends	Mainly family, friends occasionally	Carers and family

Subjective age

Subjective age is the age someone feels, this can be younger, older or simply the chronological age of the person. In general the people aging successfully feel younger than they are. However, people aging normally or pathologically feel the age they are.

Table 4. Subjective aging description for successful, normal and pathological processes

Subjective aging process	Ricardo (Successful)	Teresa (Normal)	Ebelia (Pathological)
Feels younger	X		
Feels the chronological age		X	
Conscious of the age and situation			X

Functional age

Functional age describes whether a person needs help to carry out the basic daily activities or not. Here we did not go into detail about each disability and we asked a general question -Do you need any help with dairy activities?- Functional age was one of the factors used to recruit interviewees, and was therefore simply a confirmation of the group we were interviewing.

Table 5. Functional aging description for successful, normal and pathological processes

Functional aging process	Ricardo (Successful)	Teresa (Normal)	Ebelia (Pathological)
Independent	X		
Mostly independent		X	
Dependent			X

Social age

Social age is the fulfilment of the social role and lifecycle steps that is defined by society for that age. It is significant that most of the people identified as aging successfully had a normal lifecycle and were involved in some voluntary work which they combine with other leisure activities. On the other hand, they were the people aging normally who also work, but because they took care of their house and family. The people aging pathologically had a more passive role because they were dependent, and their social relationships were limited mostly to close family and professional careers.

Table 6. Social aging description for successful, normal and pathological processes

Social age	Ricardo (Successful)	Teresa (Normal)	Ebelia (Pathological)
Lifecycle	Father and grandfather	Mother and grandmother	Mother and grandmother
Role	Happily retired role, happy grandfather	Busy grandmother, mother, sister… Multi-carer roll	Dependent person
Social involvement	Voluntary work, spend time with friends and wife	Mostly takes care of the family and occasionally spends time with friends	Carers, family and visitors

4.3 Capabilities and habits

To describe capabilities we kept the division proposed by Designing With People (Myerson et al., 2011) that considers the things that a person can and cannot do. As habits we consider the occupation, and the activities that a person does during a typical day.

Capabilities

In this part of the interview we asked about the things that the person could and could not do. As shown in Table 7, an activity that the successfully and normally aging people describe as too demanding is to carry heavy things. In these two categories of aging the speed of movements reduces with age. We realized that in this section it would be helpful to have a description of the Basic Activities of Daily Living and the Instrumental Activities of Daily Living (Katz, 1983) to help researchers orientate the questions.

Table 7. Description of Capabilities for successful, normal and pathological processes

Capabilities	Ricardo (Successful)	Teresa (Normal)	Ebelia (Pathological)
What I can do	Day to day activities, hiking all day, spend hours in the vegetable garden	Day to day activities	Talk, eat, watch TV
What I cannot do	Carry heavy things, make fast and repeating movements	Run, climbing stairs without help, lift heavy things, walk quickly, take things from high closets	Take care of herself, walk alone, get up alone, clean

My condition
The section of the template *my condition* asks about health conditions in general, this may be too similar to the biological age and we suggest removing this point for next studies.

Habits

In Table 8, we can see how normally and pathologically aging people were mostly women who worked as a housewives their entire life. However, people aging successfully worked outside the home and we think that it can be a significant factor that determines what kind of aging a person will develop. Housewives never retire before they became dependent, so they spend most of their free time taking care of others even when they would prefer to do something else.

Table 8. Description of habits for successful, normal and pathological processes

Habits	Ricardo (Successful)	Teresa (Normal)	Ebelia (Pathological)
Occupation	Former manager of maintenance in a company	Housewife	Former housewife
A typical day	9:00 Wake up and have breakfast. Go hiking. 12:00 Shopping, have lunch, have a nap 17:00 Vegetable garden 19:00 Go for a walk 20:00 Go home and have dinner, watch TV 23:00 Go to bed	10:00 Wake up, breakfast and pills Take care of sister, cook for all the family 15:00 Lunch with family and cleaning. Nap watching TV 17:30 coffee with sisters and cook dinner 20:00 Dinner, go for a walk and watch TV 23:00 Go to bed	All day in bed Breakfast 14:30 Lunch 18:00 Visits, and watching TV 21:00 Dinner

4.4 Related products and services

One of the things that surprised us was the number of people that talked about the same products when asked about poor designs that impact their life. Stairs were present among all the three groups, and also the packaging of some foods. Asked about products that improve their lifes the answers were more different, but a significant number of people considered home delivery services very helpful, we think that this is related to the difficulties they have carrying heavy things. Finally, when asked about the five most important things in their life, they all gave family as the answer but there was some difference in the other four things. For the people aging pathologically the most important "things" were the people that take care of them, for example, doctors, assistants… For the people aging normally friends and some hobby, and for the successfully aging people other pleasures appear and also helping others. It can be concluded that people don't give so much value to some things until they don't have their basic needs covered.

Table 9. Related products description for successful, normal and pathological processes

Products and services	Ricardo (Successful)	Teresa (Normal)	Ebelia (Pathological)
Good designs	Glasses, mobile-phone, tablet, car, traveling	Shopping home delivery services, lift, static bicycle, remote assistance, panic collar, walking stick, glasses	Wheelchair, sonotone, caring services, articulated bed, oxygen machine, home doctor
Poor designs	Stairs	Stairs, some packaging, tall closets, technology	Stairs, little steps, shower
Five most important "things" in my life	Helping others, family, friends and little pleasures of life	Family, friends, grandchildren, handcrafts	Family, doctor, assistant, visits, TV

5 CONCLUSIONS

The objective of this study was achieved successfully. We reviewed the different models of the Personas tool and selected the most suitable one to integrate the characteristics of elderly people. As a result three "Elderpersonas" were created, three preliminary Personas profiles obtained from the patterns identified in 36 interviews. These "Elderpersonas" will be the first of a more extensive list of profiles that will be included in the Human Centered Design Methodology of the DBZ (Innovation Design Centre of Mondragon Unibertsitatea). The "Elderpersonas" will help designers or design teams with limited resources obtain initial understanding of elderly people before starting with their own research. However, on contrary to what some authors suggest (Norman, 2004; Djajadiningrat et al., 2000; Dantin, 2005; Pierson et al., 2008) we recommend comparing information of these fictional profiles with the analysis of real people to validate the effectiveness of the profiles in a specific context.
We discovered interesting and relevant information about the characteristics of elderly people in the Basque Country. Looking at the results obtained we can conclude that the kind of aging is also related to gender roles. The way in which a person has invested their free time before retiring and the care of others during their lives, determine the energy and motivation to enjoy daily life and to take care of themselves. Regarding the products and services that improve or impact their lives, it is worth noting that many interviewees use the home delivery services of shops and supermarkets. On the other hand, the biggest obstacle that most interviewees encountered was going up and down stairs.

We can conclude that the method was valid and this tool enabled us understand elderly people and their needs and goals better, using few resources. Despite the sample being rather small it did not prevent us from identifying patterns of behaviour. Moreover, the addition of different kinds of ages to the previous template proved extremely useful in obtaining more detailed and relevant information. The explanation of the aging development was crucial to the understanding of the situation of each interviewee and enables the researchers to adapt their conduct to working with Elderpersonas.
However, some information may seem repetitive, for example when we ask about *my condition* we talk again about biological age. We therefore propose removing one of those template sections so as not to repeat too many questions. We also repeat the same questions when asking about functional age and capabilities but we feel that this is necessary in order to obtain a deeper understanding.

After analysing the different variables we can suggest that the most significant kind of ages in order of importance are the psychological, the functional and the social ages as some authors suggested before (Jiang et al., 2016). In further studies we will redesign the template created for the tool "elderpersonas" removing the point of *my condition* and substituting it with a new section called Basic and Instrumental Activities of Daily Living on the description of the functional age. Secondly, we will expand the study, interviewing more elderly people. Finally, we will carry out further case studies to demonstrate their value in practice.

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