



Design and evaluation: End users, user datasets and personas



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ABSTRACT

Understanding the needs and aspirations of a suitable range of users during the product design process is an extremely difficult task. Methods such as ethnographic studies can be used to gain a better understanding of users needs, but they are inherently time consuming and expensive. The time pressures that are evident in the work performed by design consultancies often make these techniques impractical. This paper contains a discussion about the use of 'personas', a method used by designers to overcome these issues. Personas are descriptive models of archetypal users derived from user research. The discussion focuses on two case studies, the first of which examines the use of personas in the car design process. The second examines the use of personas in the field of 'inclusive design', as demonstrated by the HADRIAN system. These case studies exemplify the benefits 'data rich' personas contribute as opposed to 'assumption based' personas.

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1. Introduction

Inclusive Design like other user centred design disciplines requires a focus upon user needs and requirements. However it is not always appropriate or possible to directly involve users in commercial design processes due to time, cost and logistical constraints. In light of this, approximations to end user requirements may have to be derived by other means. This paper explores the contribution of personas and existing user datasets, in this context. In addition, this paper explores a new approach through a software tool called HADRIAN that utilises the benefits of both developments. All of these design methodologies have developed in specialised fields; yet, taken together, they have the potential to provide both a psychological and physical underpinning to inclusive design applications in the future.

2. Personas

Personas are descriptive models of archetypal users derived from user research. They are a synthesis of multiple people who share similar goals, motivations and behaviours. Typically, between 1 and 7 personas will be developed to support a project with differences between each persona based on differences in goals

and behaviours rather than demographics or market segments (Saffer, 2007). To encourage realism, and so increase engagement within the design team with these end user representations, each persona is given a realistic name, a photo, and a small amount of demographic information to make it seem like a credible representative of the user population. Pruitt and Adlin (2006) make the distinction between data driven and assumption driven personas. Data driven personas are grounded in user research and as such their validity can be high. However when there is little time to collect and analyse data, assumption based personas are often used to ensure that there is a shared understanding throughout the design team relating to who the users might be and their likely goals and motivations. Whilst the term 'persona' was first coined by Alan Cooper in the context of Interaction Design (Cooper, 1999), personas within the Inclusive Design process for any product or service can be a powerful tool for understanding and visualising user goals, motivations, relationships with existing products and contexts of use.

2.1. The role of personas

The value of using personas to communicate user data to designers is recognised within Inclusive Design (Carmichael et al., 2005; Goodman et al., 2006). Carmichael et al. (2005) used theatre techniques encapsulated within video to communicate older users' experiences with technology to designers. They concluded this methodology increased the impact of personas as a

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tool for communicating user data to designers. Goodman-Dean et al. (2010) studied design practice to ascertain which user data formats are most acceptable to designers. They confirm that designers value design information that is quick and easy to use, visually stimulating, flexible, open ended and clearly and concretely related to design issues. Personas, the authors conclude, suit informal and flexible working and when visually compelling are ideally suited to engaging designers and fostering empathy with user needs. However, Goodman et al. warn that personas are not well suited to presenting detailed technical information about, for example disabilities, and their focus on archetypal users can make it hard to communicate the range of abilities within a population. As a project moves from the requirements and concept generation stages to the product development stage more specific data about the capabilities of users may be needed to supplement the use of personas.

Lähteenmäki and Kaikkonen (2004) describe other issues, such as how older users are often treated within design as a homogeneous group whilst in reality they are as heterogeneous as any other customer segment, perhaps more so as age can bring a differentiation in needs because of variation in physical capability and life experiences. They also argue that within the body of research related to designing products for older adults, consideration of the motivational needs of users is under represented with the majority of research focussing on understanding how ageing has a detrimental effect upon the physical and cognitive abilities of users.

Sets of personas can be used within design to address some of these issues. Firstly, personas can be used to highlight the diversity in lifestyles present within an older population as shown in the case study below. Secondly, since personas emphasise the needs and motivations of users, they can be a powerful way of ensuring that inclusive design doesn't become overly focussed on overcoming barriers to product use but instead focuses upon the creation of positive user experiences for all. However the use of personas within design does not automatically lead to usable, useful and satisfying products since personas are only as good as the data they are built on (Nardi, 1995). Pantzar (2002) warns that in the absence of actual user research (data driven personas) there is a tendency for self deception to creep into design. Well crafted and engaging assumption driven personas can provide a persuasive and compelling vision of users which masks a scarcity of real knowledge on user needs. Assumption based personas often reflect "marketing clichés" rather than the more everyday needs and characteristics of the actual target user population.

2.2. Persona development case study

At its inception, the persona process was born from a need to embed end user needs within the software applications of digital products (Cooper, 1999), to add detail of user requirements within the design process. However the underlying principles make their application suitable to just about any field of design and, recognising this, the Design Team at the Ergonomics and Safety Research Institute (ESRI – *now Loughborough Design School) within Loughborough University transferred the methodology to the automotive sector as a mechanism for disseminating field research to Nissan's designers.

Primary research into the current and anticipated future lifestyle activities of Baby Boomer (born during the post-WWII baby boom) drivers was commissioned by Nissan. The methodological challenge was to anticipate how lifestyles and in particular factors relating to car use were likely to change as the current generation of baby boomers age. As each generation of adults has accumulated different cultural and product use experiences it is problematic to predict the needs and motivations of future older users from the

behaviour of today's older generation. The ESRI Design Team used a variety of methods within the research:

- A *Cultural Prime* (Sleeswijk-Visser et al., 2005) was designed to sensitise the study participants to the focus of the research before attending the focus group sessions. Primes are a variation of the Cultural Probes technique (Gaver et al., 1999). They are used to provoke people to look closely at their current experiences and to begin to think about their aspirations and values. They also serve as a probe for the researchers by providing insight into the lifestyles of the study population. The prime consisted of a camera and a booklet containing a series of tasks and questions presented in an engaging and playful form. These addressed the participant's relationship to their current car, past vehicles they had owned, car journeys and cars of the future. The prime also began to move the participants towards considering how their car related needs might change with age – a topic that needed to be approached with sensitivity as the ability to drive is tied closely for many with the concept of independence.
- A series of *Focus Groups* were held in which participants' attitudes concerning current and anticipated future lifestyles were explored. (The Focus Groups comprised a total of 28 participants, equally split between the genders, whose mean age was 61 years (range was 55–67 years). Focus groups were also held with participants who were ten years older who were asked to reflect back on how their lives had changed over the previous ten years (mean age 69 years, range 65–75 years). The investigative methods used were:
 - A 'Location Mapping' tool was designed to prompt participants to recount their typical use of the car. Based on the mobility mapping tool of Mitchell et al. (2004) this prompted recollection technique was used to elicit from each participant a range of typical journeys, detailing the purpose; frequency (daily, weekly, monthly, occasionally); distance travelled (local, regional, national, international) and their driver or passenger status
 - Change analysis explored how participants' felt their lives might change over the next ten years in the key areas of family, friends, work, health, hobbies/leisure, holidays, shopping and finance. The participants then had to indicate the impact they considered these changes might have on future vehicle use (increase '+', about the same '0' or less '-'; See Fig. 1 which illustrates the layout of the data collection sheet).

This first-hand data collection approach allowed data driven personas to be created. The collected data was summarised and then used as 'factoids' (key data points) within the persona development process as described by Pruitt and Adlin (2006). Initial categories of user were identified in terms of user goals. Facts relating to these goals were then extracted from the focus group comments and other collected material, which formed the 'factoids'. These were then sorted to identify sub-categories and skeletons created and prioritised against the initial brief. Finally the highest priority skeletons were developed into full personas. Data were sorted and categorised independently by three researchers then reviewed collectively to reach consensus, to reduce individual partiality as much as possible. Additionally, through use of careful sampling (recruiting a wide variety of participants) and a mixed methods approach, bias was minimised. By following this process, five distinct personas were created reflecting the lifestyles of Baby Boomer drivers. These were:

- 'The Carer' persona who has responsibilities for transporting parents/partner either on pleasure trips or more regular visits, e.g. to hospital.

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