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Tomasz Miaskiewicz

University of Colorado at Boulder, miaskiew@colorado.edu

Susan Jung Grant

University of Colorado at Boulder, susan.jung.grant@colorado.edu

Kenneth A. Kozar

University of Colorado at Boulder, kenneth.kozar@colorado.edu

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A Preliminary Examination of Using Personas to Enhance User-Centered Design

Tomasz Miaskiewicz
University of Colorado at Boulder
miaskiew@colorado.edu

Susan Jung Grant
University of Colorado at Boulder
susan.jung.grant@colorado.edu

Kenneth A. Kozar
University of Colorado at Boulder
kenneth.kozar@colorado.edu

ABSTRACT

Organizations now routinely collect information about the needs of their consumers/users, but this information is not sufficiently utilized. This research investigates how encapsulating the user needs in a persona affects the resulting design decisions. Personas put a face on the target users and create a vivid design target by using a narrative, picture, and name. In our study, we examine whether personas help designers make more effective design decisions. We also focus on the roles of empathy and memory, and investigate whether personas introduce greater empathy into product design. The results suggest that personas lead to more effective designs when empathy for the persona is created. On the other hand, when the user needs are summarized in a tabular format, the participants must rely on memorization of the user information. The implications of the results and how follow-up studies will tackle unanswered questions are explored.

Keywords

Personas, user centered design, product design, empathy, user requirements

INTRODUCTION

A significant shift occurred within the design practice in the 1980s. With the development and popularization of user-centered design (UCD), an approach to design that centers the design process on user needs rather than focusing on aesthetics (Norman, 1988), the users became a vital part of the design process. The UCD process starts with the identification of the target users (the individuals being designed for) and then inquiring about their specific needs and goals. Next, in an iterative manner, prototypes of the product or system are produced and tested with representative users (Wood, 1995). By knowing the specific needs of the target users early in the design process, UCD leads to design of products that are more likely to incorporate those needs in the subsequent product design.

However, UCD has had problems achieving the user centeredness that it strives for. Numerous authors have pointed out that the users' needs are still not the focal point of many design processes (Dahl, Chattopadhyay and Gorn, 1999; Gulliksen, Göransson, Boivie, Blomkvist, Persson, and Cajander, 2003; Pruitt and Adlin, 2006; Schaffer, 2004). In effect, a disconnect often exists between the designers and the target users (Grudin and Pruitt, 2002). The well-documented usability issues of websites, systems, and products provide further anecdotal evidence that many UCD processes are failing to focus design activities on the user needs (Bylund, 2006; Kalin, 1999; Nielsen and Norman, 2000; Temkin and Hult, 2005).

Before designing a product, organizations now routinely collect information about their target users (Pruitt and Adlin, 2006), so why are these user needs not given sufficient prominence during the design process? We believe that the problem exists with the form in which this information is then summarized and communicated to designers. The information about the user needs is typically summarized and distributed to designers in the form of a "user requirements" document (Pruitt and Adlin, 2006). User requirements summarize the findings of user research in a lengthy spreadsheet, table, or as bullet points – specific user needs are simply line items or rows. However, this extensive and potentially very useful information about the users has proved not to be useful (Pruitt and Adlin, 2006; Willis, 2004).

In this research, we contend that the root of the problem with capturing and communicating user needs in a user requirements format is that this information fails to build empathy for the target users. Knowing what the users desire is often not sufficient to incorporate the user needs into design decisions – we argue that identification with and empathy for the users must be present.

Personas provide an alternative way of encapsulating this information about the user needs that could introduce greater empathy into UCD. Personas are “fictitious, specific, concrete representations of target users” (Pruitt and Adlin, 2006, pg. 11). A persona represents a group of individuals who share common characteristics – it provides a hypothetical archetype of real users (Cooper, 1999). Even though a persona represents the similarities of a group of individuals about whom information was collected, the persona describes a specific individual who has a name and a face. A persona description is written in narrative form about this person. The narrative is very detailed, and contains information about the persona’s occupation, family, friends, possessions, likes, and so forth (Grudin and Pruitt, 2002). These details make the persona seem like a real person in the minds of designers and help to build empathy for the persona (Cooper, 1999; Pruitt and Adlin, 2006). The narrative also explicitly identifies the goals, needs, and frustrations of the persona in the context of the product being designed.

In this paper, we first examine how summarizing the information about the users in a persona affects the effectiveness of the resulting design decisions. While practitioner accounts of persona use have been generally positive (e.g., Cooper, 1999; Grudin and Pruitt, 2002; Hourihan, 2002), their effectiveness compared to the traditional user requirements format has not been empirically validated. We also examine the roles of empathy and memory in making an effective design decision that meets a specific user need, and whether personas are the mechanism through which greater empathy can be introduced into UCD.

In the following section, we discuss pertinent research, and develop three hypotheses that will be the focus of our study. Next, we present a preliminary experiment that tests our hypotheses. We then turn our attention to a discussion of our findings, and how follow-up studies could tackle research questions that still remain unanswered and address the limitations of this study.

LITERATURE REVIEW AND HYPOTHESES

Personas and Empathy Building

Due to proliferation of UCD, designers are typically not “in the dark” about what the target users/consumers desire from the products that they are designing. As noted by Bailetti and Litva (1995, pg. 3), “despite all best efforts, the design process often leads to the introduction of products that do not meet customer expectations. Although the design team typically applies customer-related information from several sources, the product design somehow fails to satisfy customer requirements.” The information about the user needs is available, but often is not incorporated into design decisions.

Perhaps, as argued by Rifkin (1994) and Leonard and Rayport (1997), we need to move towards empathetic design, where designers are able to see the world from the perspective of the target users. Empathy is the English word used to express the German *einfühlung* (Vischer, 1994), “a feeling-into someone else’s life” (Stern, 1994, pg. 612). Empathy has been defined as both an affective and a cognitive trait (Joliffe and Farrington, 2006), but some argue that empathy is purely an emotional response (i.e., the ability to experience the emotions of another) and the cognitive capacity to see the world from another’s viewpoint is not empathy but perspective taking (Galinsky et al. 2008). In this research, we treat empathy as “the ability to see the world, including one’s own behaviour, from another person’s point of view” (Hollin, 1994, pg. 1240). In other words, when a designer practices empathetic design he or she is experiencing the design as if s/he were the user.

Personas can introduce greater empathy into the design process through the narrative that is used to describe the fictional individual that the persona represents (e.g., “Steve Gates”). A persona tells a specific story about the persona that provides designers with a snapshot of the persona’s world (Pruitt and Adlin, 2006). When faced with a design decision, the designer is able to ask questions such as “does Steve need this feature?” or “does this design element make sense to Steve?” When a designer is experiencing the design from the persona’s perspective, the user needs are more likely to be satisfied during the design process. Specifically, we hypothesize the following:

Hypothesis 1: When a designer develops empathy for a persona, the resulting design will more effectively meet specific user needs.

The Roles of Memory and Empathy

While a persona presents the user needs in the context of a narrative about a specific fictitious person, a user requirements format lacks this personable information. Requirements are written about general “users.” There is no story behind the factual presentation of the user needs. Without any information about whom the target users are, a designer is unlikely to develop an empathetic connection with the individuals being designed for. Without the ability to experience the design as if s/he were the user, the designer must then rely on recalling user needs. Therefore, to produce an effective design, a designer

must be able to memorize and recall the actual user needs while performing a design task. On the other hand, when designers develop empathy for the target user, they can rely on this empathetic connection to view the design from the persona's perspective and can infer which design elements will meet specific user needs. More precisely, we hypothesize:

Hypothesis 2a: When designing a product using user requirements, the effectiveness of the resulting design will have a positive relationship with the number of user needs that were correctly memorized. The relationship will not exist when using a persona during a design task.

Hypothesis 2b: When designing a product using a persona, the effectiveness of the resulting design will have a positive relationship with the level of empathy for the persona. The relationship will not exist when using user requirements during a design task.

We anticipate the two processes specified in hypothesis 2 to affect the resulting design outcome, but we also expect designers who rely on empathy for the user needs (as opposed to memorization) will produce more effective designs. Research studying the design process has shown that relying on memory can result in suboptimal designs (Dahl et al., 1999; Smith, Ward and Schumacher, 1993). When empathy is present, the designer can internalize the needs of the users and view the design from the perspective of the persona. The designer understands the needs and feelings of the persona, and has a desire to design a system that would please the persona. In effect, the designer is less likely practice self-centered design, where his or her own preferences drive the design process instead of the actual user needs. Hence, our third hypothesis is:

Hypothesis 3: The most effective designs will be produced when empathy is present for the user's needs.

METHOD

146 undergraduate students from a business school at a large midwestern university participated in the experiment in exchange for course credit. Upon entering the lab, the participants were asked to sit at any of the available desks in the lab. After the consent forms were signed, instructions were provided to the participants that briefly introduced the design task. The participants were told that they would be designing a My Yahoo! page, a customizable webpage (or "portal") that allows individuals to personalize the information that is provided for a specific target user.

The experiment was composed of a 3 (User Information: high empathy persona vs. low empathy persona vs. user requirements) X 2 (Memory: high vs. low) between-subjects design. The user information manipulation determined the format of the information about the target user. The memory manipulation determined how long the participants were allowed to review the information about the user needs. The specifics of the manipulations, measures, and experimental task are elaborated upon in the subsequent sections.

User Information Manipulation

After all of the participants read the instructions, they were provided with the user information. In the user requirements condition (UR), participants were provided with a table that listed ten specific requirements for the My Yahoo! design. For each requirement, a requirement number, name, and description were provided. Each of the ten requirements had an environmental theme (e.g., green energy, global warming). For example, the first requirement was named "hybrid technologies," and the following description was provided:

The target user is interested in hybrid cars. The user wants the My Yahoo! page to contain news about hybrid technologies.

In the two persona conditions, the participants received the same ten user requirements in a persona narrative format (for example personas and guidelines for writing personas see Pruitt and Adlin, 2006). The persona was first given a name ("Frank Woodward") and a picture. Also, personal details about the Frank persona were provided to make him seem like a real person. Frank was made a police officer, so that initially the participants were unlikely to have a high level of empathy for the persona. Then, in the high empathy condition (HP), the Frank persona was described in a manner that would facilitate the development of empathy. Specifically, Frank was described as a fair, liberal, locally involved, environmentally conscious police officer. It was believed that this persona would resonate with the characteristics of the participants within the local community (traditionally very liberal, concerned with environmental issues such as global warming and renewable energy, etc.). On the other hand, in the low empathy condition (LP), Frank was described in a manner that was believed to hinder the creation of an empathetic connection. Frank was described as a tough police officer that took advantage of his authority, and who was strongly against environmental efforts and the liberal views of the local community.

Next, the ten user requirements were included as part of the narrative that describes the needs of the Frank Woodward persona. For example, the previously mentioned requirement concerning hybrid technologies was included within the narrative as follows in the HP condition:

Frank also is considering purchasing a new Toyota Prius hybrid car to make his contribution to the fight against global warming, so he finds the hybrid-related news on My Yahoo! an essential resource that helps him become better informed about hybrid technologies.

In the LP condition, the same requirement concerning hybrid technologies was written to fit the low empathy version of the Frank persona:

A few of the fellow officers that Frank dislikes recently purchased Toyota Prius hybrid cars, and Frank finds the hybrid-related news on My Yahoo! an essential resource for stories that he perceives as biased in favor of hybrid technologies

The participants were told to read the user information carefully, and were instructed to use the provided information as a basis for their design decisions in the subsequent design task.

Memory Manipulation

Once the participants were provided with the user information, the memory manipulation determined how long they were allowed to review this information. While design practitioners typically do not have explicit limitations on how long they are able to review the information, the manipulation allowed us to approximate the role of memory in design decisions.

In the low memory condition, the participants were able to review the user information for only one minute. Pre-testing determined that one minute allowed enough time to quickly skim the user information once. In the high memory condition, participants were provided with three minutes to read the user information. Pre-testing determined that three minutes provided sufficient time to thoroughly read the user information twice. All of the participants in a single experimental session were assigned to the same memory condition.

Design Task and Evaluation of Design Effectiveness

After either 1 minute or 3 minutes, the participants were told to return the user information to the individual running the experiment. After the user information was collected, the participants were provided with instructions, a piece of poster board, envelope, and tape.

The design task asked the participants to design a My Yahoo! webpage for the target user on the piece of poster board. As mentioned above, My Yahoo! allows a user to customize a specific webpage and personalize the information that is provided in the form of small modules or “content areas.” For example, an individual can customize My Yahoo! to include content areas that provide the latest information relevant to interests such as sports, cooking, or entertainment news. The envelope that was provided to the participants contained 31 content areas that could be included on the poster board. The task required the participants to choose which of the content areas matched user needs that were specified in the user requirements or in a persona, and tape the appropriate content areas onto the poster board. The participants were allowed to design the My Yahoo! page as needed.

Two judges worked independently to score each of the poster board designs. For each design, the judges recorded the number of correct content areas that matched the user needs, incorrect content areas (e.g., information about popular television shows, job listings), and incorrect content areas that had an environmental theme but were not directly desired by the user (e.g., fuel conservation, land preservation). The judges had complete agreement across the scoring criteria for 120 out of the 146 poster board designs. The judges then resolved any disagreements in the scoring by reviewing the specific poster board again, and came up with a final consensus scoring of the design. Finally, the judges calculated a single design score for each poster board design. For each of the correct content areas that were included, a point was added to the overall design score. Then, for any of the incorrect content areas that were included points were deducted with the incorrect content areas that had an environmental theme receiving a smaller deduction. Introducing unnecessary and unwanted features and information is detrimental to the usability of a design because it introduces complexity, so the participants were penalized for including content areas that were not desired by the user.

Ancillary Measures

After finishing the My Yahoo! design, the participants were asked to provide answers to questions concerning the variables of interest. The empathy for the end users was measured with six items that were based on existing empathy scales such as

the Basic Empathy Scale (Jolliffe and Farrington, 2006), but were rewritten to measure the empathy for the target users (e.g., "During the design task, I found it easy to view things from the target users' perspective"). The level of memory of the user information was evaluated by asking the participants to list as many of the specific user needs that they could recall. Finally, the participants answered a series of classification questions concerning their age, gender, major, internet usage, previous design experience, and perceptions of the design task.

Summary

After receiving instructions, the participants were provided with the user information either in the form of user requirements, or in one of the two versions of a persona (high or low empathy). After reviewing the information for either 1 or 3 minutes, the participants designed a My Yahoo! page that they thought best satisfied the needs of the target user that they received information about. Finally, the participants answered questions about variables of interest and provided basic demographic information.

RESULTS

134 poster board designs were analyzed via a 3 (User Information: high empathy persona vs. low empathy persona vs. user requirements) X 2 (Memory: high vs. low) between-subjects ANOVA. Manipulation checks confirmed that participants' perceived empathy (Cronbach's alpha=0.80) for the two personas significantly differed ($M_{HP} = 5.24$ vs. $M_{LP}=4.52$; $t=2.99$, $p<0.01$). Also, the participants that were given 3 minutes to review the user information (high memory) were able to correctly recall significantly more user needs than participants who were given only 1 minute (low memory) ($M_{HIGH} = 5.83$ vs. $M_{LOW} = 4.91$; $t=2.78$, $p=0.01$).

Effect of Types of User Information on Design Effectiveness

What role did the three types of user information have on the effectiveness of the poster board designs? Figure 1 summarizes the mean design scores by experimental condition. The type of user information did have a significant impact, and a main effect occurred such that the HP group outperformed the LP group ($F(1,128)=4.63$, $p=0.03$). Therefore, as predicted, the participants who had more empathy for the persona produced significantly better designs, and hypothesis 1 is supported by the results.

However, hypothesis 3 is not supported by the results. We cannot conclude that the HP group or the UR group did consistently better on the design task ($F < 1$). However, it is interesting to note that when given additional time, the UR group significantly outperformed the HP group ($F(1,128)=6.19$, $p=0.01$). This result suggests that in some circumstances (particularly when sufficient memorization of the requirements is possible) the UR group will outperform the HP group. On the other hand, a persona that we have empathy for might be more beneficial when exposure to the user information is limited. The implication of this result will be examined in follow-up study.

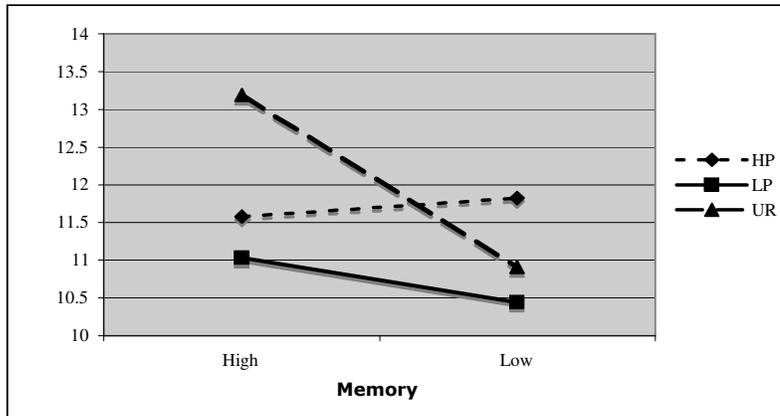


Figure 1: Mean design scores by condition

The Role of Empathy and Memory on Design Effectiveness

Did empathy and memory have different roles for the participants provided with a persona as opposed to user requirements? The number of user needs that were memorized and correctly recalled had a significant relationship with the resulting design quality only for the UR group ($t=5.75$, $p<.01$). On the other hand, empathy for the target user only had a significant relationship with the resulting design effectiveness for the HP group ($t=2.43$, $p<.05$), and the ability to recall specific user needs did not have a significant impact ($t=1.08$; $p=0.14$). On the other hand, since the LP group was not able to develop a strong empathetic connection with the target user, empathy did not play a significant role in producing an effective design ($t=1.84$; $p=.07$). Hence, hypotheses 2a and 2b are supported by the results of the experiment.

GENERAL DISCUSSION

When empathy is developed for a persona, this empathetic connection seems to allow designers to overcome a lack of knowledge of specific user needs, and still produce an effective design. The design is viewed from the persona's perspective and what the persona desires can be inferred. On the other hand, user requirements require a memorization of (or active access to) the information about specific user needs to produce a successful design.

Our research also has several limitations that should be addressed. First of all, as with most experiments conducted in a controlled setting, the external validity of this research could be questioned. Specifically, the realism of the design task can be of concern. The participants were students who worked individually, had a limited amount of time, and simply taped specific areas of content on a poster board to produce a design. On the other hand, professional designers can vary greatly in their experience, work individually and in groups, and design a variety of products and systems. However, it should be noted that designers often work individually and also under serious time constraints (Dahl, Chattopadhyay, Gorn, 1999). Also, the design task matches closely to the paper prototyping exercise that designers typically do as one of the preliminary steps in the design process (Mayhew, 1999). Therefore, we believe that our findings are applicable to some real-world design scenarios.

Additionally, surprisingly the participants who were provided with user requirements responded that they had as much empathy for the target user as the HP group ($M_{HP}=5.24$ vs. $M_{UR}=5.42$; $t=.846$, $p=.40$). Perhaps, since the requirements were written about topics that are typically seen as favorable such as hybrid cars and green energy, the target user were able to picture themselves or someone they knew based on reading the specific needs of the target user. For example, when asked whether the target user reminded the participants of their friends, the UR group was able to picture the abstract "user" and compare him/her to a friend ($M_{HP} = 2.89$ vs. $M_{UR}=3.51$). To address the issue, in a future study user requirements should be chosen that are less favorable to the participants, but could still be written in a way to generate empathy in the context of a persona narrative.

CONCLUSION

An adage that is fundamental to UCD is: "Know thy user, for she is not you." However, as this research suggests, knowing what the users desire is not the only way to practice UCD. Building empathy, and "getting into the head of the user" is another and possibly more effective approach to building products that meet the needs of the intended users. While further research still needs to be performed, this study takes the first step in examining the role of empathy in user-centered design and showing that personas are a vehicle for building empathy.

REFERENCES

1. Bailetti, J.A. and Litva, P.F (1995) Integrating customer requirements into product designs, *Journal of Product Innovation Management*, 12, 1, 3-15.
2. Bylund, A. (2006) Complexity causes 50% of product returns: scientist, Reuters, March 2006. <http://go.reuters.com/newsArticle.jhtml?type=technologyNews&storyID=11440298&src=rss/technologyNews>.
3. Cooper, A. (1999) *The inmates are running the asylum*, Morgan Kaufmann, Indianapolis.
4. Dahl, D.W., Chattopadhyay, A. and Gorn, G.J. (1999) The use of visual imagery in new product design, *Journal of Marketing Research*, 36, 1, 18-28.
5. Galinsky, A.D., Maddux, W.W., Gilin, D. and White, J.B. (2008) Why it pays to get inside the head of your opponent, *Psychological Science*, 19, 4, 378-384.
6. Grudin, J. and Pruitt, J. (2002) Personas, participatory design and product development: an infrastructure for engagement, *Proceedings of the Participatory Design Conference*, 144-161.

7. Gulliksen, J., Göransson, B., Boivie, I., Blomkvist, S., Persson, J. and Cajander, A. (2003) Key principles for user-centered systems design, *Behaviour & Information Technology*, 22, 3, 397-409.
8. Hollin, C. (1994) Forensic (criminological) psychology, in A. Colman (ed.) *Companion encyclopedia of psychology*, Routledge, London, 1231-1253.
9. Hourihan, M. (2002) Take the “you” out of user: my experience using personas, Boxes and Arrow, March 2002. http://www.boxesandarrows.com/view/taking_the_you_out_of_user_my_experience_using_personas.
10. Jolliffe, D. and Farrington, D.P. (2006) Development and validation of the Basic Empathy Scale, *Journal of Adolescence*, 29, 4, 589-611.
11. Kalin, S. (1999) Usability: mazed and confused, *CIO Web Business Magazine*, April 1999. http://www.cio.com/archive/webbusiness/040199_use.html.
12. Leonard, D. and Rayport, J.F. (1997) Spark innovation through empathetic design, *Harvard Business Review*, 75, 5, 102-13.
13. Mayhew, D.J. (1999) *The usability engineering lifecycle: a practitioner’s handbook for user interface design*, Morgan Kaufmann, San Francisco.
14. Nielsen, J., and Norman, D.A. (2000) Usability on the web isn't a luxury, *Information Week*, January 2000. <http://www.informationweek.com/773/web.htm>.
15. Norman, D.A. (1988) *The psychology of everyday things*, Basic Books, New York.
16. Pruitt, J. and Adlin, T. (2006) *The persona lifecycle: keeping people in mind throughout product design*, Morgan Kaufmann, San Francisco.
17. Rifkin, G. (1994) Product development: empathetic design helps understand users better, *Harvard Business Review*, 72, 2, 10-11.
18. Schaffer, E. (2004) *Institutionalization of usability*, Pearson Education, Boston.
19. Smith, S.M., Ward, T.B. and Schumacher, J.S. (1993) Constraining effects of examples in a creative generation task, *Memory and Cognition*, 21, 6, 837-845.
20. Stern, B.B. (1994) Classical and vignette television advertising dramas: structural models, formal analysis, and consumer effects, *Journal of Consumer Research*, 20, 2, 601-615.
21. Temkin, B. and Hult, P. (2005) Usability flaws of financial service web sites, Forrester Research, July 2005. <http://www.forrester.com/Research/Document/Excerpt/0.7211.37302.00.html>.
22. Willis, D. (2004) Are useful requirements just a fairy tale?, Boxes and Arrows, July 2004. http://www.boxesandarrows.com/view/are_useful_requirements_just_a_fairy_tale_and_why_an_ia_should_care_.
23. Wood, L.E. (1998) *User interface design: bridging the gap from user requirements to design*, CRC Press, Boca Raton, FL.
24. Vischer, R. (1994) On the optical sense of form: a contribution to aesthetics, in H.F. Mallgrave and E. Ikonomou (Eds.) *Empathy, form, and space: problems in German aesthetics*, University of Chicago Press, Chicago, 98-173.

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