An Exploratory Study for Provocative Prototypes: Creating Personas

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Abstract: In a typical design process, the user group is one of the most important pillars for design decisions. The characteristics of the intended user group is usually identified with the help of personas. Personas help designers to create empathy with their user group and understand their needs and preferences better. In other words, designers use personas as a prototype to provide constructive design critiques to their designs. However, persona creation for the design of products with novel technologies is challenging as there is no real user of these technologies to base the persona on. This problem leads us to a workshop in which we question a provocative design solution where personas from fictional users are created and tested by the designers. Two groups, each having three participants, prototyped personas by real world scenario mapping and tested them by provoking conceptually with binary questions.

Keywords: provocative prototypes; persona; design fiction

1 Introduction

Design was used to be perceived as a way for looking for solutions to people’s problems. However, recently, with the rising interest on critical design, the importance of asking questions about the problems has gained equal importance as solving the problems. Therefore, design has started to be used for the exploration of the interested issues.

Raptis, Jensen, Kjeldskov and Skov (2017) categorise the design research such as speculative, ludic, reflective, slow, counter-functional, value-sensitive and adversarial design under the term of provocative design as they have the common aim of challenging the existing with discussions and critiques and exploring the area of interest. They propose that, provocative designs can be used in research either by research through design for understanding the current practices or for exploring the potential of future design. Either way uses research through design which is explained as one of the three types of research in design by Frayling (1993).

According to him, there are three types of research in design, namely, research into design, research through design and research for design. Research into design deals with historical research, aesthetic and perceptual research and research into theoretical perspectives on art and design; research through design is more into materials research,
development, work and action research such as altering a technology to innovate and contextualizing it; and research for design focuses on the end product as the artefact aiming at knowledge in the sense of communication tools.

To understand possible technological futures, hypothetical or fictional prototypes can be used as a source of knowledge to both their designers and users in the practice of research through design (Vaihinger, 1921/2009). Here, the prototypes are not necessarily be the physical products representing the final design, but the tools used as a source for exploring not only the consequences of a design but possibilities for a design.

In this study, personas as representatives of users in the futures are used as the prototypes for the source of questioning the future technologies where no or very little experience of users is within reach. Being in quest of a design problem where asking questions is as important as searching answers is the prominent reason of this exploratory study. By using real world scenario mapping method, designers can create fictional personas or persona prototypes and get immersed in the created persona’s life to reach not the results of the designers’ imaginary boundaries but the results of the interactions occurring in the story world, therefore, to produce richer design insights.

2 Related Literature

2.1 Persona Creation in the Design Process

The concept of persona, along with its coined name was originally defined by Cooper (1999, p. 123) as “pretend users”. Cooper’s personas are representative and archetypal: although they are products of the designer’s imagination, they are created by the deduction of actual data. Using personas is a family of methods in which designers attempt to extrapolate from their data, preferably in situations where direct communication and testing with real users is unfeasible (Pruitt & Grundin, 2003). However, personas potentially offer more than being time savers. This deduction brings its own value to the table: most often than not, raw data from user observation is either not directly convertible to design insights, or such different stakeholders in the process come up with conflicting insights (Pruitt & Adlin, 2006; Mulder & Yaar, 2007). Personas can solidify coherent design intentions from data and allow different parties to communicate on them. This communication then leads to another important purpose of using personas: they allow and encourage extrapolation (Pruitt & Adlin, 2006). Once data is shaped in flesh, designers, as well as other stakeholders can imagine its reactions in further contexts. Extrapolating personas can especially be useful in processes where the design problem is not set in stone, where designers would not only anticipate the results of an imaginary interaction but the entire interaction.

Extrapolating future interactions using personas is dependent on the complexity of them. Grudin (2006) summarized this position in three steps: (i) human beings can empathize with and anticipate hypothetical scenarios of other real human beings by creating their mental models. (ii) These models can then be transferred to fictional characters, in this case, personas; enabling them to anticipate interactions of fictional people. (iii) And this transfer requires that the fictional characters are modelled with a similar rigor and level of detail as the real human beings. This last assumption of Grudin (2006, p. 646), which in his own words is difficult to prove, relies on experimental psychology: and is inherently different from persona creation methods which relies heavily on representing empirical data (Sinha, 2003; McGinn & Kotamrajju, 2008) and instead focuses on qualitative and rich representations. While Grudin (2006) uses various approaches of psychology to define and understand human beings for anticipating hypothetical behaviour (cultural stereotypes, personal traits, goals, routine scripts of daily life and intimate information from personal observations); there is extensive literature in media and communication studies which deals with cognition of and immersion through fictional characters in narratives.

One related method of understanding fictional characters is called scenario mapping and was developed by Sanford and Garrod (1998), as a way of describing how fictional material is initially understood. Real-world scenario in their body of work is used as a “known situation” (Sanford & Emmott, 2012, p. 20), as in a situation that the reader either experienced first-hand or knew enough about from third party sources. Scenario mapping theory asserts that the reader, initially tries to map the text he reads to real world scenarios in order to understand it. While this is often the case when the fictional personas are modelled after first-hand experience with real people, it is also a reflex applied to the fictional material by the reader. Known as the rule of minimal departure, people would apply their real-world knowledge and experience to a fictional narrative unless the narrative explicitly states otherwise (Ryan, 1980).

Grudin’s (2006) transfer, from the designer’s model of real people to personas align with scenario mapping: personas are born from known situations by first-hand experience. However, the qualitative complexity of personas, which afford extrapolation comes from immersion: empathizing with a fictional character on a deeper level in a way one can
anticipate her reactions in hypotheticals. As readers interact with narrative, they do not merely construct and comprehend meaning, but they get immersed in the narrative (Zwaan, Madden, Yaxley & Aveyard, 2004). Events or emotions depicted in the narrative plays in the minds of the reader, as if they were literal.

Green and Brock (2000) explain this phenomenon, one where the reader gets lost in the narrative as transportation-imagery. Transportation refers to complete immersion to the story world, by losing the sense of time and place (Green, Brock & Kaufman, 2004). Gerrig (1991) uses the physical transportation as an analogy, in which one travels to a distant location, with restricted access to her origin location, and comes back with insights learned from the experience. The level of transportation is related with the cognitive abilities of the reader: the level of transportation is correlated by the balance between the cognitive challenge received from the text and the cognitive abilities of the reader (Csikszentmihalyi, 1991; Sherry, 2004). In this line of thinking, a narrative is more immersible when it proves to be challenging for its reader, whether by its form or content; however, it should also be mappable in the designer’s mind via real-world scenarios. This also means that immersion is subjective, and it varies among individuals. In other words, the complexity of a persona would be correlated to the challenge it brings. At the ideal level, the complexity should trigger a discursive space in the designer’s mind, encouraging her to drive the persona and the situation forward; while not being overwhelming so that it stays mentally manageable.

Real-world scenario mapping establishes a relationship between the designer and her persona within the real world where she is designing for; while transportation establish mirroring with the designer’s cognitive self. Both are mechanisms employed in narrative immersion. Since people plan their behaviour over fictive hypotheticals in their minds before taking action (Busselle & Bilandzic, 2008; Stecker, 2011), high narrative immersion has exceptional utility for designers in exploring futures in terms of novel technologies and cultural settings in which these technologies will be used.

Our proposed question then is: how can designers create qualitatively rich personas with the right amount of narrative immersion within reasonable time constraints? Our proposed answer is rapidly prototyping personas. By applying iterative and provocative prototyping techniques to personas in design ideation, we argue that designers will receive the maximum immersion in a limited time and therefore effectively generate insights for designing within novel technologies of the future.

2.2 Provocative Prototyping for Persona Creation and Testing

Prototypes are defined as the tools used for representing the final artefact to inform design process and decisions (Moggridge, 2007). Sethu-Jones, Rogers and Marquardt (2017) gather two different kinds of prototypes in technology research. In the first kind, prototypes can be used for the introduction of a new technology to everyday life and to intended context or they can be used for the introduction of an existing technology to a novel context. In the second type, prototypes are used as tools to explore the interesting technologies to be designed in the future. The second type is also referred as technology probes (Hutchinson et al., 2003) as they carry some of the characteristics of cultural probes such as being contextually appropriate and aiming to understand the use patterns. However, they are argued to be referred as exploratory prototypes (Heyer & Brereton, 2008) because they are not only for exploring the use, misuse or non-use of an existing technology in an established practice but for also exploring the new technologies in novel settings. Therefore, the exploratory prototypes do not have to be used continuously like cultural probes to be open to technologic innovations, but they must be in line with the context and provocative at the same time. Auger (2013) points provocative design to keep up with the balance between them because in design fiction, prototypes cannot be too familiar or too far to the users because they either are condemned to be unnoticed or confronted with revulsion.

In provocative design, prototypes are used as an incentive of discussion instead of a representation of the final artefact. For example, for speculative design, Dunne and Raby (2013) define prototypes as the props for imaginary films because according to them, the viewers should be active and should produce their own interpretation when engaging with the prototype instead of being passive consumers of them. These props should also be legible by the user, be consistent within the story world to generate truths compatible to that world, help people imagine the possibilities, create fictional ideals, values, and beliefs that challenge the existing ones, trigger speculation and be plausible instead of believable. In other means of provocative design, in design fiction, Coulton, Lindley and Akmal (2016) say that prototypes should be future oriented. In other words, prototypes should belong to the future world and be compatible with that world. Lindley and Sharma (2014) also refer to the plausibility of the prototypes by writing that audience can relate the reality of diegesis within the fictional world to be able to render the alternative world. With these prototypes, designers will be able to anticipate how technologies might affect the everyday lives of people (Grand & Wiedmer, 2010) and create what if scenarios (Knutz, Markussen & Christensen, 2013).
Table 1. Comparing provocative and traditional prototypes

<table>
<thead>
<tr>
<th>Provocative Prototypes</th>
<th>Traditional Prototypes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aim at understanding what future can bring</td>
<td>Aim at understanding current concerns</td>
</tr>
<tr>
<td>Encourage active participation of the audience</td>
<td>Passively consumed by the audience</td>
</tr>
<tr>
<td>Embrace different interpretations</td>
<td>Try to reach common sense</td>
</tr>
<tr>
<td>Present the plausible to reach the preferable</td>
<td>Present the possible</td>
</tr>
<tr>
<td>Create challenging ideal, values, beliefs</td>
<td>Refer to the current ideals, values, beliefs</td>
</tr>
</tbody>
</table>

3 Study

For this study, we used provocative prototyping techniques to create the fictional world as well as the motivation for the designers to generate rich personas. The study was carried out as a full-day workshop, although only the first half is planned to be used for the scope of this paper. The workshop was organized within National Design Research Conference (UTAK) at Middle East Technical University in 2018. Within the conference program, we called for undergraduate (at least in their third year) or graduate students of industrial design or related programs and ended up with six participants who are all undergraduate students. Four participants were industrial design students while two of them were from architecture departments; from 5 different institutions in Turkey and Cyprus.

Workshop environment was decorated using provocative prototypes prepared by the researchers, which were posters depicting a near future fictional world. This world is marked by the “Enhanced Privacy Certificate (EPC)”, an optional certification program for smart devices. In this world, EPC enabled devices cannot directly ask for demographic information, or grab personal data from other services or devices. However, they are expected to offer personalised services to their users, from personal traits learned from mundane daily interactions. To assist the understanding, we construed a simple kitchen appliance, a coffee machine whose job is straightforwardly to make coffee. In the story world, the smart coffee machine must make coffee to its user according to the user’s preferences by being responsive to the user’s context. However, this machine has to be personal without asking any personal questions. The aim here was to provoke the participants’ creativity for getting to know the personas.

We asked the participants to split into two teams of three and generate personas in order to design a smart and connected coffee machine for this fictional world. After the introduction of the fictional world, each team was given...
three roles to distribute to their three members. These roles were (i) user, (ii) machine intelligence and (iii) observer. A summary of each role can be found in Table 2.

<table>
<thead>
<tr>
<th>User</th>
<th>Machine</th>
<th>Observer</th>
</tr>
</thead>
<tbody>
<tr>
<td>In the fictional world, the user had just bought the smart coffee machine and casually interacts with it through answering its questions.</td>
<td>In the fictional world, this is a smart coffee machine with a conversational interface, which wants to get to know its user more through casual interaction.</td>
<td>In the fictional world, the observer is a designer/usage tester, which observes the casual interaction between the user and the machine and takes notes.</td>
</tr>
</tbody>
</table>

The workshop process involved 3 steps:

1. Users and observers of each team came together and created personas, using character sheets created by the researchers. Character sheets included but not was limited to demographic information, physical appearance, tastes (music, food, colour, etc.), facts about family and friends, fears, regrets and character traits.

2. Machines and observers of each team came together, to create questions that would be later asked by the machines to the users, in order to get to know them better. For clarity and coherence, questions were limited to binary choices (e.g. “Which one would you prefer: coffee or tea?”). Machines were asked to prepare as many questions as they need to understand the user’s character, using question sheets created by the researchers. Questions were written on these sheets, as well as the type of information that was expected to be derived from the said questions. Even though the machines prepared the questions together, they were free to add or extract to them and about the order of the questions. If they found meaningful to ask a different question according to the answer of the previous question, they had been encouraged to do so.

3. At this point, users and machines did not know each other’s preparations (Machines did not know the personas, and the users did not know the questions). A roleplaying session was conducted. For each team in turns, the machines asked the users a binary question, listened to the answer, and filled an answer sheet created by the researchers. Users were encouraged to be in character and answer the questions as their personas would. They were free to elaborate their answers on their own, as well as use theatrical elements. Machines recorded the answers with their deductions from these answers, regarding the user’s persona. Meanwhile, observers of each team, who has access to both the personas and questions, took free format notes on whether the machine deduced the correct information from the answer and if not, why.

After the roleplaying session was concluded, we asked the observers to retrospectively walk us through the process using their notes. Initial personas were compared to the guessed personas of the machines, and a discussion was had about how effective the questions and the resulting assumptions were.

### 4 Findings

Findings of the session are grouped in the following tables: Question tables show each question, its expected outcome and the information recorded by the machine after an answer was received. Persona tables show the information for the persona generated beforehand by the users and the persona deduced by the machines at the end of the process. Questions and persona tables were created by Team 1 (Table 3 and Table 4) and Team 2 (Table 5 and Table 6) and presented below respectively.

With the help of the persona creation session, the participants in the role of users envisaged characteristics of a typical persona would have such as physical characteristics, personality, social life, likes and dislikes, history, pains, regrets and dreams. Even though they were encouraged to take their time to create their personas and write their thoughts on the character sheets provided to them, they pointed that, the empathy level increased as they spoke on behalf of the personas. Similarly, the answer sheets, provoking the machine users to extract these typical persona characteristics proved that, as the machine users got immersed in the conversation, they revised their projections in a more accurate way. For example, the user participant of first group created a shallow, materialistic girl archetype and the machine participant pointed that they understood their user was as such, I after a few questions and changed their projections accordingly. Likewise, the user participant of the second group created a Spanish woman and talked with an accent during the role playing and the machine participant of the first group indicated that the way of the participant’s talk and act had a huge effect on their projections after the first answer of their user.
**Table 3. Question table for Team 1**

<table>
<thead>
<tr>
<th>Questions designers asked as a machine (P1)</th>
<th>Information expected to be found</th>
<th>Projections to the user’s answers</th>
</tr>
</thead>
</table>
| Working in the morning or working during night | Order of life  
Working hours  
Working place | Age  
Gender  
Financial situation  
Education  
Character  
Living space  
State of health  
Sleep pattern  
Dietary preferences  
Physical Activity |
| Public transportation or private vehicle | Financial situation  
environmentalism | | |
| In or out* | Sociability  
Consumption | Age  
Gender  
Financial situation  
Education  
Character  
Living space  
Physical activity |
| Homemade food or fast food | Time at home  
Dietary habits | Age  
Gender  
Financial situation  
Education  
State of health  
Sleep pattern  
Dietary preferences |
| Automatic or manual | Age  
Travel frequency | Age  
Financial situation |
| Following the agenda on the Internet or from the printed publication | Internet access  
Age | Financial situation  
Education  
Living space |
| Coffee or tea | Life style  
Age | State of health  
Sleep pattern  
Dietary preferences |
| Instagram or Twitter | Hobby  
Interests | Age  
Gender |

*This was open to inference and the participants stated that they designed this question intentionally open to interpretation believing that the response would give hints about the characteristics of the user.

**Table 4. Persona table for Team 1**

<table>
<thead>
<tr>
<th>Persona created by the machine (P1)</th>
<th>Persona created by the user (P2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>College student (18-30)</td>
<td>High-school student (16)</td>
</tr>
<tr>
<td>Women</td>
<td>Women</td>
</tr>
<tr>
<td>Living with family</td>
<td>Living with family</td>
</tr>
<tr>
<td>Drinks coffee during night for studying</td>
<td>Drinks coffee to be hip</td>
</tr>
<tr>
<td>Eats fast-food but thin</td>
<td>Avoids unhealthy food for better appearance</td>
</tr>
<tr>
<td>Upper-middle class</td>
<td>Upper class</td>
</tr>
<tr>
<td>Enjoys showing-off</td>
<td>Popularity addict</td>
</tr>
<tr>
<td>Active physical life</td>
<td>Active physical life</td>
</tr>
</tbody>
</table>
Table 5. Question table for Team 2

<table>
<thead>
<tr>
<th>Questions designers asked as a machine (Team 2)</th>
<th>Information expected to be found</th>
<th>Projections to the user’s answers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working in the morning or working during night</td>
<td>Order of life Education</td>
<td>Order of life Sleep pattern</td>
</tr>
<tr>
<td>Public transportation or private vehicle</td>
<td>Financial situation Environmentalism</td>
<td>Financial situation Education Character</td>
</tr>
<tr>
<td>In or out*</td>
<td>Sociability Consumption</td>
<td>Character Financial situation Living space</td>
</tr>
<tr>
<td>*This was open to inference and the participants stated that they designed this question intentionally open to interpretation believing that the response would give hints about the characteristics of the user</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Homemade food or fast food</td>
<td>Time at home Dietary habits Age State of health Living space</td>
<td>State of health Education Living space Dietary preferences</td>
</tr>
<tr>
<td>Automatic shift or manual shift</td>
<td>Age Travel frequency</td>
<td>Age Financial situation</td>
</tr>
<tr>
<td>Following the agenda on the Internet or from the printed publication</td>
<td>Internet access Age</td>
<td>Age</td>
</tr>
<tr>
<td>Coffee or tea</td>
<td>Character</td>
<td>Ethnicity</td>
</tr>
<tr>
<td>Wake up in a good mood or bad mood</td>
<td>Life style Working conditions</td>
<td>Character Physical Activity State of health</td>
</tr>
</tbody>
</table>

Table 6. Persona table for Team 2

<table>
<thead>
<tr>
<th>Persona created by the machine</th>
<th>Persona created by the user</th>
</tr>
</thead>
<tbody>
<tr>
<td>Middle aged (31-50)</td>
<td>Young adult (23)</td>
</tr>
<tr>
<td>Women</td>
<td>Women</td>
</tr>
<tr>
<td>Living alone</td>
<td>Living with 2 cats and a dog</td>
</tr>
<tr>
<td>Drinks coffee a lot as a Latin American</td>
<td>Drinks coffee a lot as a barista</td>
</tr>
<tr>
<td>Eats healthy, no restrictions</td>
<td>Pescatarian</td>
</tr>
<tr>
<td>Manager in a plaza</td>
<td>Barista</td>
</tr>
<tr>
<td>Activist</td>
<td>Buddhist</td>
</tr>
<tr>
<td>Regular sleep</td>
<td>A party person at the weekends</td>
</tr>
</tbody>
</table>

By looking at the question table, it can be said that, the machines corrected their assumptions about the users’ characteristics iteratively until they got clear about their doubts. However, the persona comparison tables show that, even though the machines are certain about their inference and do not need any further interrogation, they could still be wrong about their persona.

When we investigated further to the point projections, we saw that in the related questions, the user participant can be described as to be more in character and gave the response with more explanations, mimics and gestures. Moreover, the machine users explained that they were affected by their user’s language use. For example, the
5 Discussion

As can be seen in the tables the questions of the designers were designed to be easy to interpret on the response rather than to get a solid answer. If it was to be elaborated on the binary options that machines offered their users for preferring, it can be realised that the options are the possible answers of the questions that were asked for having a good comment on their user’s life. The questions included, what time period of the day they prefer for working, how they choose to travel, where they like to spend their time, how are their dietary preferences, what kind of input form they prefer on their usage, what reading medium they like, what is their beverage preference, how is their mood in the mornings and which one is their favourite social media platform. By asking these questions, they intended to acquire the answers about their user’s age, order of life, working place, working hours, financial situation, sociability, consumption habits, dietary habits, travel frequency, internet access, internet use, hobbies, interests, state of health and even their character. It seems a bit naïve to infer all these characteristics of a user from comments on binary questions but as the participants construed the characters in their conversation better, when the participants in the roles of machines finished with creating personas, they definitely had an image of their user in mind.

The question tables show that excluding age which was updated by nearly all kinds of answers, not many data points were coherent between expected information and the projections. For most questions, machines ended up discovering different types of information from the personas, from what they thought the questions would dig up.

This was in line with our expectations regarding immersion. As the roleplaying session carried on, users became increasingly more relaxed and in-character, adding more vocal features and body language as they give their answers. This richness resulted in machines to deduce new and unexpected types of information from the answers, not only by the content but also by the delivery. However, increased immersion was not only relevant to the machines who were getting to know their users. Users themselves were more immersed into the personas they devised as the process carried on. In addition to being more capable actors in roleplaying, they also made new connections between their character’s data, discovering parts of and improvising on their personas. As confirmed by the concluding discussions, users were more knowledgeable about their personas at the end of the session.

However, even though they were able to create a superficial persona based on the data they collected, the insightful nuances may be overruled by the inferences of the designers. When the main concern was to be recalled, for designing for novel technologies where no experienced users are within reach, this experimental study can be taken as a starting point for creating persona prototypes to be followed by a supportive study for freeing designers from their presumptions by encouraging immersion in the story.

Scenario-mapping was an inherent part of the process via machines, deducing information from simple binary questions, but it was also used by the users to improvise on their personas. As users became more immersed in their persona, they started mapping scenarios from their persona’s world as they answered questions, by coming up with information that was not thought beforehand while creating the personas. This both enabled participants to expand on their personas throughout the process, and to generate a follow-up discussion on what information should have been added or removed from the initial character sheets to generate rich personas.

Finally, we argue that using provocative prototypes to generate a fictional world in which the sessions occurred speed up the process. Technically speaking, the process was not much different than roleplaying; however, the inclusion of a context by such prototypes and hence, rules for roleplaying, gave a reason for the participants to be highly immersed. Machines were motivated to probe into the personas as quickly and effectively as possible, while the users were motivated to be more in-character as the machines attempted to reveal their persona, right or wrong.

6 Conclusion

Designing for products with novel technologies could bring unprecedented experiences. However, setting a stage for a predefined product or for predefined stereotypes could obstruct the emergence of these rich experiences. Therefore,

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1 Street name for Bağdat Avenue, a posh street and neighborhood in Istanbul.
putting the designers on the shoes of both the product and the user may break the empathy barrier between a novel product-user interaction and foster creativity and eventually result in design insights for new products.

At the end of the sessions, both teams had immersive and realistic personas at hand, that could potentially be used further in the design process, devised in a relatively short time. This was made possible by employing provocative prototypes to create the initial motivation to be immersed in the narrative. Further, personas were also quickly prototyped and tested by roleplaying, further enhancing their richness.

This exploratory study allowed us to speculate on Latour’s (2007) definitions of inscriptions and prescriptions. The designer’s intentions about the effects of a design on user’s actions, inscriptions, are limited to designers’ understanding about their users. Immersion in the narrative might enhance the perception of the designers about their users and thus positively affect the design process. The product’s actions that users are allowed to, prescriptions, are again depended on the designers’ knowledge about their users. By looking from the perspective of the machines, designers can test better the boundaries of the personas and question their prejudices. Therefore, quick prototyping and testing of the personas could be a way for enhancing the design process and guide the designers to more meaningful design insights.

References


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