A Life of Their Own: Museum Visitor Personas Penetrating the Design Lifecycle of a Mobile Experience

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Abstract

Sets of 'personas' representing archetypical visitors of two very different museums, the Acropolis Museum in Greece and Cité de l'Espace in France, were defined and described as part of a multitude of user-centered design methods used to better understand the needs of visitors and develop for them a personalized mobile storytelling experience. Here we reflect on the role and impact that these personas have had, not only on the design process but also as a mechanism to support the story authors and to bootstrap personalization of experiences. We conclude with a discussion of research challenges inherent in the integration of personas directly into systems intended to support the personalization of experiences.

Author Keywords

Personas; User-centered Design methods; Personalization; Profiling

ACM Classification Keywords

H.5.2 User Interfaces: User-centered design, Evaluation/methodology

Figure 1. Explicit (e.g., through a quiz) and implicit (e.g., drawing information from a Facebook profile) methods to bootstrap personalization.

**Figure 2.** *"I am Melesso. I am 2545 years old…"*

Meet Natalie Schmidt, a 35 year old IT professional who lives and works in Germany. Natalie loves her job but has many other interests as well, mostly related to contemporary art and design, music, cinema, and activities that she does when going out with friends. She travels a lot for work and always carries her smartphone and tablet with her.

Natalie's next business trip will be to Athens, Greece. She is quite excited as she will finally have the opportunity to visit the new Acropolis Museum in her spare time. A visit to such a world-renowned museum will be an excellent way to relax between meetings.

Before travelling to Athens, Natalie decides to prepare her visit by browsing the museum's website. On the homepage, her eye is caught by a teaser urging visitors with digital mobile devices to turn their museum visit into a personalized storytelling experience. Being Natalie, she of course finds this intriguing and clicks on it straight away. *The experience starts with a short quiz to get to know you, so the Museum can offer you your own personal adventure…* (Figure 1).

Natalie completes the quiz. The Museum has created a profile for her and suggests a story which Natalie will experience as soon as she sets foot in the actual Museum, a few days later. After purchasing her ticket, Natalie is ready to start her personalized visit, using either her tablet or smartphone. She decides on the former, clicks on the prompt to begin the story, wears her headphones and the voice of Melesso, a sixty-year old woman once living in ancient Athens, greets her: *"I am Melesso. I am 2545 years old. Once, a long time ago, I walked on this very soil you are standing now, feeling proud. And scared. This is my story."* (Figure 2).

Natalie, as you may have guessed, is not a real person. She is a *persona*, i.e. a constructed user model that is represented as a specific individual human being [1].
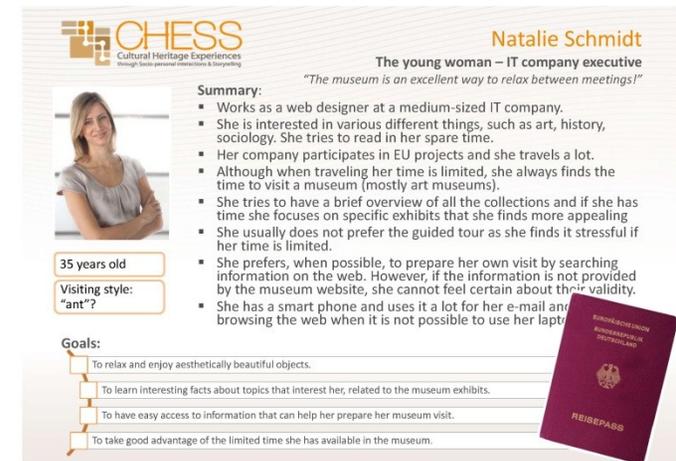
Figure 3. Persona Natalie Schmidt's "passport".

Natalie (Figure 3) and a group of other personas (Table 1, 2, 3) have been defined to aid the design of a personalized mobile museum experience, currently being developed in the context of a research project called CHESS[1].

CHESS aims at creating visitor experiences that combine storytelling and personalization, initially for two destinations: the Acropolis Museum, a world renowned archaeological museum in Athens, Greece and Cité de l'Espace, an interactive science center in Toulouse, France. The challenge of designing for two

1 The CHESS Project, www.chessexperience.eu.

Nikos Athanasiou, 10 year-old: *"The museum is boring"*	
Georgia Athanasiou, retired literature professor: *"The museum makes me feel young"*	
Jack Harris, young athlete: *"The museum would be much more interesting if the exhibits could tell me their stories"*	
Natalie Schmidt, IT executive: *"The museum is an excellent way to relax between meetings"*	
Dimitris Georgiadis, teenager: *"The museum would be cooler with technology"*	
Takis Karathanasis middle-aged shop owner: *"The museum is really great but sometimes it is too much for me."*	

Table 1. Acropolis Museum visitor personas.

very different contexts has reinforced the need to adopt a thorough human-centered iterative design approach.

Personas in User-Centered Design

Personas are detailed descriptions of imaginary people constructed out of well-understood, highly specified data about real people [1]. Put differently, personas are not actual people but are synthesized directly from observations of real people. As a design tool, personas provide a powerful way to communicate behaviors, goals, wants, needs, and frustrations. The goal in constructing a particular set of personas is to represent the diversity of observed motivations, behaviors, attitudes, aptitudes, mental models, work or activity flow, environments, and frustrations with current similar systems, if any [3].

Museum Personas

Different people, different stories, told differently. For museums, the new outlook is to create experiences connecting to visitors' interests, dreams, familiar faces or places. In other words, to offer personal narratives which visitors can, implicitly or explicitly, build on when visiting a cultural site. Still, designing such interactive mobile experiences is not without challenges.

Creating a system, like CHESS, intended for use by a diverse audience of users, does not mean designing a system as general and broad in its functionality to accommodate most people. As one of our consulting museum experts noted: "Instead of making the museum averagely interesting to the average visitor, we wish to make it very interesting to the individual visitor". This is why we decided early on to define different visitor and author personas for the two museums, to aid both design collaboration but also the

more technical development of personalization (one of the project's main research challenges).

The current set of six visitor personas for the Acropolis Museum, two for Cité de l'Espace and one author persona for each, seems to reflect, at least for now, the user base and to cover our initial design needs.

Defining the persona variables

We created empirically-grounded visitor and author personas, which were consequently formed in more detail through studies with real visitors and in participatory design workshops. The definition of personas for CHESS has been the result of the synthesis of data from a variety of sources. Multiple methods were used to collect, collate and verify information, including: gathering quantitative and qualitative (e.g., with ethnographic methods) data about the museums' visitors and staff-at-work; iterating prototypes; gathering stakeholders' feedback through two workshops; and reviewing the literature on museum visitors and visiting styles [2][6].

This data has been pieced together to define a set of 26 demographic and behavioral attributes. These form the essential set of user characteristics that relate to user needs and preferences during a museum visit. They can be used to describe each user and, consequently, each persona (Figure 3). Although personas cannot and do not need to be completely accurate [1], the point in filling up these variables is to ensure that they reflect the essential information about target users.

The variables include demographics (age, gender, origin, language), skills and experience (educational

Lucas Durand, 10 year old: *"The museum is boring"*

Céline Moreau, 40 year old mother: *"I want to discover space & astronomy with my children"*

Table 2. Cité de l'Espace museum visitor personas

Ellie Petrou, archaeologist - curator: *"New technologies are challenging for me, but they're worth the effort"*

Christian Boulay, science museum educator: *"All new tools are exciting and useful for my work"*

Table 3. Museum staff personas

level, profession, experience using digital devices), possible disabilities, interests (general and museum specific), visit specifics (visit duration, returning visit), preferences related to the visit (visiting style, exhibits to visit, preferred narration style, preferred level of interactivity, etc.). The defined variables are modeled under the employed user modeling framework and the predefined persona values are used for initializing the corresponding persona profiles.

Validating our personas

In order to validate our personas but also to collect data in a more focused manner, we organized a workshop with domain experts as well as field studies with specific (real) visitors of the two museums. Initially, a set of visitors was invited to experience the Acropolis Museum over the course of two days, in 2011, using paper prototypes of the mobile storytelling experience under development. These individuals were selected to match, as closely as possible, the personas that had been crafted (Table 1), and were shadowed by researchers of the project team while moving about the museum, alone or in pairs. In subsequent formative studies, these and other visitors have been observed with later iterations of the prototypes (Figure 4). As a result, not only was the initial set of persona variables adjusted multiple times but also a new persona was added to the set (Dimitris "the teenager") in an internal workshop as part of the validation process.

Coming to Life
Various reports of the usefulness of personas have noted that one of the important aspects of success is the adoption of personas by the design team [5].

Indeed, one of the main and perhaps unexpected outcomes of persona introduction in CHESS has been the level of their penetration in the design processes of the project, across the different design teams. Collaboration in interdisciplinary projects such as CHESS can be challenging because different teams of researchers and practitioners, with different skills, goals and understandings of what must be produced, come together [4]. This is especially true with user-centered design research, the value of which can, many times, be underestimated by the technology developers. In the case of CHESS, our personas have been instrumental in establishing the end-user at the center of focus, giving the opportunity to the different teams within the project to speak the same language. Thus, everyone in the team, from the user researchers and story authors to the programmers, refer to Lucas, Céline, Nikos, or Natalie on a daily basis; the end-user has acquired a "face" and our personas have succeeded in becoming like real people in our minds.

To enhance this value of believability, but also to support the project's research on personalization and user modeling, we have decided to go a step further and create e-mail accounts for our personas as well as, in some cases, Facebook accounts (Figure 3).

In addition to the complete penetration of the personas in the project design cycle, possibly even due to it, the personas became present as a concept for the implementation itself; they have been used to address profiling initialization issues and have been integrated as story element attributes in the story model and its authoring tool.

Figure 4. A 10 y. old boy and his mother, matching Nikos and Georgia Athanasiou personas respectively; during the persona validation study with paper-based prototypes, in July 2011 (above); and with the currently implemented personalized digital storytelling experience, in December 2012 (below).

Personas for profiling and personalization

As a first step towards coping with the complex adaptation and personalization issues of interactive non-linear storytelling in a museum, personas were employed to address the personalization cold start problem [7]. The objective was to match each new visitor profile with a specific persona and then offer to her the experience most suitable for this persona.

To this end, the visitor at the beginning of the CHESS experience is asked to respond to a brief quiz. Each answer is associated with: i) a specific value from the domain of a persona variable, ii) an intensity value indicating the strength of the preference, iii) an indication if the action shows positive or negative preference. Having the quiz evidence been interpreted into the CHESS user model, a persona-matching procedure takes place, calculating the similarity of the user with the available persona profiles. As a first-step similarity measure, the cosine similarity is used; given the common liked objects a visitor and a persona share, a value between [-1, 1] is computed, where -1 denotes total dissimilarity and 1 complete similarity.

The exploitation of persona profiles for story selection has been evaluated at Cité de l'Espace and preliminary evaluation results indicate that the proposed approach is very promising for initial story selection. More details on this approach may be found in [7].

Currently, the personalization research in the context of the project has moved a step further from the initial persona matching mechanism for story selection. This, however, is still present as a failsafe mechanism.

Personas in support of the story authors

Further proof of the penetration of our personas in all design stages is their use as a guide for the creation of the interactive stories. The CHESS authoring tool has been designed to support story authors (museum staff, writers, educators) in creating and producing stories. As the personas are concepts that have been adopted and used by the participating museums, we felt it would be useful to keep this notion for the authoring tool that is being developed.

Museum experts who have been exposed to the personas insisted on their strong presence in the developed tools; they consider them very convenient to signify that a particular image, narrative style, subject, narrator, or story unit "would be interesting for Natalie" or "is appropriate for Nikos".

Thus, the personas feature among the attributes available to the author when compiling a story. They can be used to "tag" particular story elements and assets such as images, videos and other material. These persona tags are translated to user characteristics to be later matched with user profiles and personalize the visitor experience (Figure 5).

The Personas Have Come to Life. Now What?
Since the beginning of the project we have seen the personas taking an unexpected life of their own and becoming instrumental in defining a common language between museum experts, story authors, psychologists, IT researchers, and developers. They have been an integral part of the requirements, design, and implementation cycles and we have seen them being
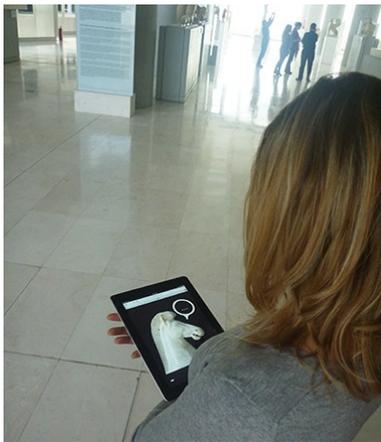
Figure 5. Using personas for personalization: different visual elements in the experience appear to visitors who have been matched to different personas.

used for personalization and story authoring. Personas worked for us in more ways than we had imagined.

But what comes next? As the project matures and moves towards more formal evaluation processes, several questions remain:

I. Have we really exhausted the potential of this powerful tool or can we still take it further? As we proceed with the development of the CHESS authoring environment for museum staff, we believe that personas can still be useful in supporting us with design decisions in defining the authoring tool's feature set.

II. Despite continuous formative design and evaluation, when creating a set of representative profiles for visitors, are these personas truly representative? Is a set of, say, six personas enough to represent the full visitor base of a large destination museum? Is it a matter of quantity? Perhaps such questions can be addressed by further studies on a larger scale, aiming at improving the representation of visitors by personas. We have thus designed an on-line study presenting various questions from the initial personalization quiz. Our goal is to attract a large response, collecting data that, when statistically analyzed, can provide us with more information on visitor trends.

III. Which is the defining variable(s) for each persona? So far personas have been employed in CHESS as archetype profiles to provide user-based recommendations. But what if a real visitor does not correspond to any of the personas or, quite likely, matches equally with more than one? We are currently implementing content-based profiling techniques to infer individual visitor attitudes from their input and behavior. Our immediate plans are to compare the

results of the two approaches, identify the strengths and weaknesses of each approach and define a hybrid solution that can leverage the power of both.

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