Personas and scenarios: Design tool or a communication device?

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Abstract. Using personas and scenarios is one way of working with usability in system development projects. In this paper we describe our experience of using the personas and scenarios within a large, on-going European research project called NEPOMUK. We describe the project background as well as the project work with the purpose of critically examining how the persona method has been applied within the project. Our conclusion is that the persona method has been most useful for translating the users' context to be understood by the project stakeholders and in promoting the idea of user-centred design. However, it has been less successful as a design tool.

Keywords: User-centred design, case study, field study, contextual interviews, observations, personas, scenarios.

1 Introduction

The challenges of working with usability in system development projects become even greater when performing large multicultural and multidisciplinary projects in which the different partners have varying agendas and research backgrounds. Using personas, fictitious persons that represent the users, and scenarios is a well-known design tool to help with usability decisions. It is also an effective communication device that allows usability experts to inform project stakeholders about the users' context and ensures that all project stakeholders can relate to the future users of the system and understand why the system has to behave in a certain way. Personas can be seen as a way of giving all project members a unified picture of the intended users. An important side effect of the method is that it promotes the philosophy of user-centred design.

This paper uses the NEPOMUK[1] project as a starting point for discussing whether the persona method is primarily a design tool or a means for communication—or whether it possibly aids both communication and design.

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The project is still in progress, but we would like to take a step back at this point and critically reflect on how the personas and scenarios have been used so far in the project and focus on both the benefits and drawbacks of our approach.

We begin by describing the project background, the purpose of the project and the setting in which it is performed. We then describe the different field settings in which our end users are working. We give an overview of the methods we have used to collect data for the creation of the personas and scenarios and discuss the field study we have performed. Finally we introduce the NEPOMUK personas and reflect on how they have been used in the project. We conclude with remarks on how we could have worked differently with personas in order to increase the effect of the persona method on the system.

2 Project background

NEPOMUK stands for Networked Environment for Personalized, Ontology-based Management of Unified Knowledge. The project group consists of 16 European partners representing researchers, industrial software developers and representative industrial users. The enterprises of the partners vary from small-scale companies with a handful of employees to big international business corporations with thousands of employees. The project is organised into eleven work packages, seven dedicated to technology and administration and four case studies with representative end users.

The aim of NEPOMUK is to develop the *Social Semantic Desktop* that will help empower knowledge workers to better exploit their personal information space and maintain a fruitful communication and exchange within social networks across organizational boundaries [9]. The *Social Semantic Desktop* will comprise of a set of technical and methodological solutions for supporting the knowledge life cycle. It should help with the management of all relevant information in the personal work–space via different media, and with applications linking information based on semantic data structures, together with non-intrusive support to generate metadata.

Within NEPOMUK a philosophical, overarching idea on how the *Social Semantic Desktop* should be developed and how technology could help achieve the goal and bring the system to the people was emphasized. The project is technology driven, but awareness of the need to understand the end users in order to make a useful and usable system was strong, but it was not necessarily clear how this could be accomplished. This was where our group came into the picture.

Our research group from the Department of Human-Computer Interaction at the Royal Institute of Technology (KTH) was the last partner to join NEPOMUK. The KTH group was asked to assume responsibility for the usability aspects of the intended system, concentrating their work towards the final year of the project to assure a user-friendly interface. However, usability research and the Scandinavian tradition of cooperative design have demonstrated that successful systems development is dependent on early user input: when designing and implementing a system, the users of the system need to be involved early in the design process to ensure that their needs and requirements are met [1, 8, 10].

The KTH group emphasised from the beginning of the project that we needed to work with the users throughout the whole development process, and that the users should not be brought in only towards the end as mere test persons and evaluators. We argued for our approach by showing examples from previous research projects and by hands-on experiences of our methods, such as video prototypes [5, 11].

As in other projects with a number of different research groups involved, the work process has been under negotiation. Still, our relation with the other partners has been good and we have most certainly been welcomed and accepted in the project, albeit with a certain degree of scepticism. Our methods have probably seemed too *non scientific* and *non measurable* to be taken seriously. Our research group is multi-disciplinary, consisting of computer scientists, programmers, industrial and graphical designers, anthropologists and ethnographers. The cooperative design agenda is strong [10, 12] and design methods and processes are an important part of our research. We suspect that we differ significantly from the common picture of a research group in the field of computer science and systems development.

This paper is based on our experiences told from the perspective of one project partner, the KTH group. There are certainly other views on many details, but with this background we want to give a picture the design process and about the importance of finding a successful user-centred method that all partners could accept.

3 Field settings

The field setting consists of four case studies with representative industrial users who participate in the project as case study informants. They work in different business areas but all are knowledge workers, creating, capturing, organizing, accessing and using knowledge on a daily basis [13]. The different case study partners are *Institut Pasteur* in France, *Time Manager International* (TMI) in Greece, UK and Denmark, *SAP Research* in Germany and the Linux community *Mandriva Club*, based in France but with members worldwide.

Most of the case study partners are providers of information, field data and a test bed for prototypes created in the project. Some partners are also users of the information collected in the field studies, since they are also responsible for developing prototypes within the project. The boundary of user versus developer is often unclear and on a number of occasions the people who are observed, interviewed and have participated in prototype evaluations also turn out to have a strong effect on functionality and visual form of prototypes.

At *Institut Pasteur* the focus is on biomedical research, doing experiments in the lab, analysing the material and writing up the results in scientific papers. The work varies from very focused, individual work in the lab to writing papers for meetings with colleagues in which experimental data are analysed and documented. The setting is a research lab, which is a part of a large research institute. The locality is quite narrow and small; the limited space makes planning important for the usage and the activities.

TMI are management consultants, who work for diverse clients offering training and consulting within the area of organisational development. The work is mainly

divided between sales and delivery of projects. A large amount of the daily work activities focuses on managing training or consulting projects. *TMI* consultants also produce and/or adapt presentations and training material on topics based on the client profile and needs they discover during the preparation phase for each project. The offices are carefully branded with access to conference rooms and common areas. Some of the offices are decorated with *TMI* slogans and philosophy, which attempts to accentuate every employee's individuality, their strengths and weaknesses.

SAP Research is a department doing research and development in important *SAP* business areas. Performing projects in-house or with external partners, trying out new ideas, testing and evaluating products with the purpose of both contributing to SAP's product portfolio and to publish research papers. *SAP Research's* work environment feels like in-between research and industry. The work is divided between individual research and meetings with colleagues, either physical meetings or via telephone or videoconference. Initially we did not notice a lot of social activity in the office, but after spending time in the field we realised that people often socialised in their offices and during lunch. People also socialise digitally, via e-mail and project wikis.

The *Mandriva Club* members are Linux users who utilize the online community mainly to download new software but also to search for information about new downloads. Another activity is to search for information for solving problems with one's own Linux installation. Advanced members also provide the community with solutions to problems they have experienced and solved themselves. These activities are almost always carried out individually and with virtual conversation in the discussion forum. The *Mandriva Club* members are driven by the open source philosophy and their work for the community is often a hobby they perform in their private time parallel to their work or other activities.

4 Field study

Below we discuss our field study research methods, contextual interviews, observations and personas and scenarios. In the following section we will discuss the specific activities in NEPOMUK.

Contextual interviews are an effective method for eliciting user requirements because they are a combination of an interview and observation. The method is very useful since it is performed in the informant's work environment, which gives an in depth understanding of the work situation, needs and requirements. It is easier for the informants to give detailed descriptions because they are in their work place and have all tools nearby. It also gives the interviewer a better chance to ask relevant questions, get a better understanding of the work environment as well as to observe first hand the tools used and activities performed to carry out the work [1].

Observations are a powerful way of understanding the work environment and the informant's situation. The observations mean that we spend time in the workplace, sit in a workplace like other employees (if possible) and participate in activities such as work, meetings and socialisation. All senses are present and active when observing and different kinds of equipment can be used to collect and save the data acquired during the observation. The researcher may or may not have direct contact or

communication with the people whose behaviour is being recorded. The observations are an important complement to the interviews since they give us the possibility to validate what the informants discuss in the interviews [14, 15].

One distinct advantage of the observation technique is that it records actual behaviour, not what people say or believe they do. Thus, the actual recorded behaviour of informants can be compared to their statements. Particularly, when dealing with behaviour that might be subject to certain social pressures or behaviour that deviates from the official (or regulated) work process, the observation technique can provide greater insights than can many other techniques [8, 14]. Observations do not provide insights into what the informants may be thinking or what might motivate a given behaviour or a comment. Such information can only be obtained by directly or indirectly asking the informants [14].

Personas are fictitious persons that represent the needs of larger groups of users in terms of their goals and personal characteristics [2, 3, 6]. Although personas are fictitious, they are based on knowledge of real users. Comprehensive user research is needed to create personas, in order to ensure that they are good representations of the end users rather than the preconceived ideas of the person writing the personas. Scenarios are an essential complement to personas and a key element in making the persona complete. In our usage the term persona encompasses both personas and scenarios.

Personas act as stand-ins for real users during the phases of the project when real users are not easily reached—they support but do not replace other user-centred design activities like contextual inquiry and scenario-based design [1, 7, 16, 19]. The design group can concentrate on designing for a manageable set of personas knowing that they represent many users. Personas are typically intended to have two roles in a project; they are a design tool as well as a communication device.

Figure 1. NEPOMUK programmers discussing during a workshop in Paris. Behind them there are life-size persona figures looking over their shoulders.

Personas are used to understand and focus on user needs and desires and to communicate these among the stakeholders in a project [7]. They also help the design

group develop a system that supports the users and functions as a guide in decisions about functionality and design. It is easier to discuss and explain design ideas when they are based on persona goals [3]. It is important that personas have a presence in the project in order to have a sustainable effect; this can be done in many ways, usually by putting images of personas on walls. Another method is to create life-size personas that are present in the project place, looking over the shoulders of the project group while they are working (see Figure 1) [4].

A persona consists of a persona description and goals. They are brought to life by being given a name, a life, a personality as well as a portrait. Meet Dirk (see Figure 2), a NEPOMUK persona. Dirk is a PhD student at SAP Research in Germany. He is a young man who is into sports and likes to spend time with his girlfriend Anna.

Figure 2. A portrait of Dirk.

Dirk works in projects at *SAP Research* in Karlsruhe and has an academic supervisor at the University of Karlsruhe. The project work entails reading and writing project deliverables and frequent trips to different project partners and to *SAP's* head–quarters in nearby Walldorf, where he has meetings with developers to help coordinate work on proto–types and the transfer of project results.

From Dirk's persona description and his scenarios one can get to know him and understand his work situation. His major problem is that he has very little control over his own time and that makes it difficult for him to find enough quality time to work on his PhD thesis. Most of his time is spent working on different projects, attending meetings and travelling. This information, which is the result of in-depth studies of users, helps us design software that can support him in his daily work and to fulfil his goals of getting a PhD and securing a good job afterwards.

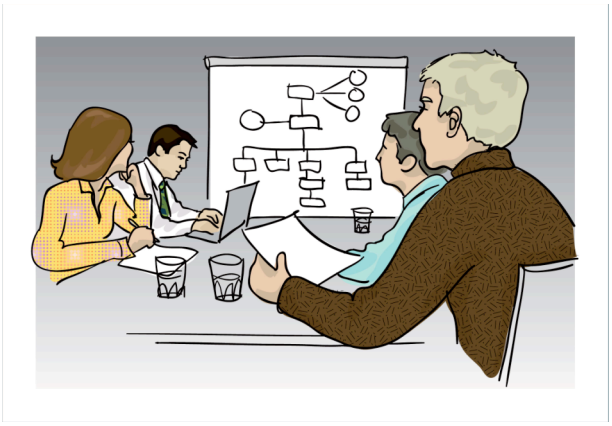

Figure 3. Dirk attending a meeting in a project he is just starting to work on.

To complete the persona, scenarios are written in which the persona fulfils his or her goal by using the system being developed [3, 6, 17]. The scenarios are based on

the needs that are discovered during the field study and they illustrate the feeling of using the new system, but the scenarios do not include detailed design decisions. Those decisions are taken later in the process when the scenarios are analyzed further by the design group, prototyped and evaluated. The scenarios are often illustrated to make the story more descriptive (see Figure 3). The scenarios are usually the first design efforts in a project and are the result of several important contributions: the users' needs and desires; the ideas the design group has accumulated through research and analysis of collected data about the users; and, lastly, the limitations of the design space. Another important contribution to the scenarios was our previous design experience working on other projects with knowledge workers as well as other types of users.

Scenarios and scenario-based design has been used for a long time and has been written about extensively. Scenarios are stories that help us understand the user situation and therefore aid us in the design of systems for the users. Scenarios always include a sequence of events and typically have characteristics like a setting, a goal and an actor [16, 19]. However, there is very little in-depth discussion about the actor of the scenarios, about her values, aspirations, even her goals [17]. It has been argued that scenarios without actors (or personas) are not as engaging and they are also less memorable than scenarios based on a certain persona [17, 18]. Grudin and Pruitt [17] claim that scenarios are also less effective when not built on personas. Besides enriching the scenarios, personas themselves add more value to a project; they describe the intended users and communicate the information collected during the field study [17].

5 Nepomuk field study

The initial research activities performed during our NEPOMUK field study were contextual interviews and observations. The material from these field study activities was analysed and formed the basis for the creation of 14 personas and 40 scenarios. We watched the video material from the contextual interviews to extract the results that were noted down in a simple spreadsheet. We also worked through our field notes and our impressions as well as observations during the field study. Afterwards the field workers and other members from the KTH group discussed and analysed the material in workshops.

Overall we made 15 field visits during which we conducted interviews and observations of the workplaces and the work being carried out. We performed 40 interviews, most of them contextual in the informant's work environment. After the initial field studies and the creation of the personas and the scenarios, we conducted seven workshops within all case studies, using different types of workshop methods, mainly video brainstorming and prototyping [5].

During the field studies we visited the different settings and performed our contextual interviews. We discussed the informants' role at the work place and their typical workday, which tasks they performed as well as problems they experienced. We also asked them to show us the tools they use to perform their tasks, both digital and analogue, such as software, phones, and notebooks. In order to collect material to

create personas we asked the informants to describe both positive and negative aspects of the work and to describe workdays that they remembered as *bad* and *good* [2]. Most of the interviews were individual and lasted for about one hour.

During our visits we also conducted observations. We participated in meetings and in as much work activities as possible. At *Institut Pasteur* we videotaped the work in the lab and segmented the recordings in order to focus on certain actions and then discussed them with the lab staff in order to get a deeper understanding of their activities [8]. At *SAP Research* we participated in meetings as well as seminars. We also spent time in the office, just hanging around chatting with people in their office or during breaks. At *TMI* we participated in a training course *TMI* performed in Uppsala, Sweden. Participating in the course meant that we were able to observe and participate in *TMI* employees' work from initial project conception to execution.

6 NEPOMUK personas

We created personas for each case study: Ella, Marie, Pierre and Keith from *Institut Pasteur*; Claudia, Dirk, Ambrosia and Martin from *SAP Research*; André and Kim from *Mandriva Club*; Karen, Alistair, Nasim and Josephine from *TMI*.

The personas vary in the tasks they perform during a typical workday as well as in their needs and behaviour. Some personas want to understand how the system works while others do not care and simply want the system to help them perform their tasks without difficulty. We have André who is used to searching for material in the *Mandriva Club* and then we have Kim who is not as experienced and needs a different type of support to use the community for his purposes. When Karen, from *TMI*, is working on a training course, she is responsible for performing the right kind of quality training and Josephine makes sure that all the practical things work out. Claudia from SAP has relatively good control over how she spends her workday and takes care of all her tasks, Dirk on the other hand struggles more with finding time between the tasks he has to perform in his project to write on his PhD thesis. Since Ella is Marie's supervisor they use the *Social Semantic Desktop* to help Ella give Marie good supervision guiding her to the final goal of getting a PhD.

We also wrote one or more scenarios for each persona. These scenarios are all based on our analysis of the field study material collected in the case studies as well as on our design experience. During the field studies we identified several problems and bottlenecks that prevent the users from performing their work in a way that suits them and their personal or professional goals. We will not be able to solve all of the problems since some of them are outside the scope of the project. But other problems can be solved with an improved desktop environment where the tools are easier to use and the information is semantically annotated. In the scenarios we demonstrate how the *Semantic Social Desktop* could support the persona in her activities. We do not make detailed design decisions in the scenarios; instead they are a description of what the user could do in the new system and how she can fulfil her goals. Each scenario may consist of one or several design ideas that need to be explored further. The scenarios show how the system can help the users work, for example to be able to perform their tasks more effectively to make space for other tasks.

7 Usage of the NEPOMUK personas

The personas were introduced to the NEPOMUK project five months after the project started. Dirk and Claudia were introduced to the project group during a meeting with all project partners represented. Included in the presentation of Dirk and Claudia was a short overview of how to use personas and scenarios. The other personas were introduced separately to each case study partner. The personas and their scenarios were also documented on the project wiki, accessible for everyone in the project. Included in the wiki were definitions of the different terms used (such as persona, scenario, etc) as well as a general description of the method. During the project we have promoted the personas in different ways, for example by bringing them up in discussions during meetings (both face-to-face and in digital communication), by sending out e-mails with news of the personas and by consistently using the personas during all project presentations we have performed.

Parallel to these activities we have tried to observe the usage of the personas to understand and analyse the method. We have performed interviews with 30 project members specifically discussing the personas to complement our observations.

Below we discuss and analyse several anecdotes we have observed and experienced since the introduction of the personas until the writing of this paper. To summarize the usage of the personas we can claim that the personas have been used quite extensively as a communication device, but much less as a design tool.

The personas have been a very effective as a communication tool in the project; almost everyone knows at least Dirk and Claudia who are the first two personas we introduced in the project. But the personas have not been used to the extent we intended for making informed design decisions. Since the project is still ongoing this is still an open question, which we will attempt to answer later, when we proceed with the analysis of the interviews with the different project stakeholders.

The NEPOMUK personas are frequently used for communication. They are very visual, look professional and are relatively accurate descriptions of what the project wants to achieve. That the personas have worked well as a communication tool became obvious when we were presenting the project progress for our reviewers from the EU. This presentation was crucial for the project and the project coordinators decided that Dirk and Claudia were to be used as example users during the presentations as well as in the demonstration of the different types of software. They are not as frequently used as an argument for different types of functionality. A programmer in NEPOMUK sent an e-mail out to the whole project detailing a messaging service. To motivate the service he used a few scenarios of the NEPOMUK personas, like “Delegate this task to Dirk”. Asked why he had used the personas as motivation, the programmer argued that he was trying to “… make everyone buy my story quickly and with little discussion” and then he added “…in fact, I had no discussion in the end” [Personal communication].

When asked why they do not use personas for making design and development decisions the project members very often explain that the personas are not relevant for these discussions because they are about fundamental technical solutions and not about interface. Our hypothesis is that since the project originally included the KTH

group in the project to take care of the interface of the NEPOMUK system they do not feel that our work has any meaning for other parts of the system.

Another reason is that while almost everyone feels that the personas are a good representation of what NEPOMUK wants to achieve, the programmers feel that some of the scenarios written are completely out of scope; some scenarios illustrate functionality that is not being developed within the project. Alistair, a *TMI* persona, for example uses a speech application in one scenario, which is not going to be developed in the project. Faced with one scenario that is out of scope, many of the programmers have ignored all the remaining scenarios. One programmer said during an interview that when he first read some of the scenarios he thought: "Are they [the KTH group] in the same project as me?" This is a programmer who was involved in the proposal writing of the project and was well aware of the technology that was going to be used.

A NEPOMUK meeting was held in month 17 to coordinate and discuss the case study partners' requirements on components from the technology partners in order to create prototypes to be tested in the case studies. This would in theory have been a very good opportunity to use the personas as an argument for a certain technology to be delivered to the case study partners. We observed this meeting to see how the personas were used to illustrate the need for the specific applications. During a two-day meeting the personas were not mentioned once. The word *user* was expressed three times in a short anonymous scenario to illustrate the need for technology.

It has appeared that some of the programmers were very critical to the details in the persona descriptions. This is an observation that we have made in other projects in which we have used personas. One of the personas, Claudia, has a cat and later in the project we informed the project members by e-mail that Claudia had obtained a new cat. The purpose of the e-mail was to tell general news of the personas and to remind the project members of their presence. This news of Claudia had apparently the opposite effect; it encouraged the project members' criticism of the persona details. One project member told us in an interview about the persona usage in the project; "Now you have to bear in mind; all participants of the project are computer scientists, which means we don't give [a] rat's ass whether Claudia got a cat or not!" It is important to note that they all seem to realise that the details are there to make the persona more alive and real. When asked which personas the project members remember, they frequently mention the details and not necessarily the persona names.

As discussed above, the KTH group differs in culture and methods from other partners in NEPOMUK. A project member has even called us "exotic", which is not a term you often use to describe a Swedish research group. We are a multi-disciplinary group and prefer to share our results and validate them through workshops and other activities. All project members have not appreciated this way of working. After a three-day workshop, where we worked our way through all the material produced by the KTH group, as a result of our field studies and analysis thereof, in order to discover abstract functionalities for the *Social Semantic Desktop*, one programmer wrote on his blog that the work resulted in "… a list of extremely general and obvious things like "search", which again, we could have written down over lunch. (or maybe [programmer's name] was right, maybe it only seems that way because I've been breathing the semantic desktop for a year)".

During the project we have noticed that in order to inspire people to use the personas and scenarios as we originally intended we would have needed to work much more on the introduction of the method and the personas themselves. Nevertheless, they seem to have been used for communication and most project members find the personas useful although not many of them claim to have used them much. Many project members claim that they do not need the personas, that they have a good view and knowledge of the users anyway.

Early on in the project we sent out a picture of all the personas to all members in the NEPOMUK project. We suggested that they could use them as a desktop image on their computer. Several project members have the picture, either on their computer desktop or in their office space. When asked why they have these pictures in their work place several project members commented that they had the pictures of the personas to keep the users in their mind and to inspire them and help stay in or switch to the NEPOMUK context. They also mentioned that they liked having them visible in order to explain the project for people who wanted to know more about it. We take this to mean that the personas are a successful reminder of the project and the end users we are developing for.

8 Concluding remarks

We believe that personas are a good method to use in large projects like NEPOMUK because it can successfully translate the users' context to the project stakeholders and promote the idea of user-centred design. But we also believe that there are improvements to be made in our future application of the persona method. The persona method has to be introduced more thoroughly to the project members and they need to be educated in the use of personas. It is also necessary to prompt more extensive the use of personas by spending time with the developers, either in person or digitally via e-mail or chat. It would also help to have a persona and a usability spokesperson present in the different partner organisations. Almost all the project members are computer scientists with no experience in user-centred activities and all the methods used by the KTH group were new to them.

Another improvement is to reduce the number of personas. Even though we treated each case study as a separate project, there were situations in which a project member had to deal with all 14 personas. This reduction in the number of personas has been attempted in the project, and we have chosen four primary personas for NEPOMUK as a whole, Marie, Dirk, Karen and André (seen life-size in Figure 1). Ideally, we should have provided all the project partners with life-size figures to remind them of the personas and to show the importance of the personas in the project.

Most importantly, we would have benefited from a more thorough knowledge of the different working cultures of the 16 NEPOMUK partners as well as their different goals for the project. Thus we could have avoided writing scenarios that were unrealistic and which in turn decreased many project members' confidence and trust in the personas.

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