

Persona Usage in Software Development: Advantages and Obstacles

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Abstract—The Personas technique has been promoted as a strong tool for providing software developers with a better understanding of the prospective users of their software. This paper reports from a questionnaire survey regarding knowledge about Personas and their usage in software development companies. The questionnaire survey was conducted in a limited geographical area to establish the extent of Personas usage within all companies in the chosen region and determine whether software development companies used Personas during the development process. Several issues were identified as reasons for either not using the technique or for poor application of it. The study showed that 55% of the respondents had never heard about Personas. Among those who had heard about the Personas technique, the following obstacles towards usage of the technique were identified: Lack of knowledge of the technique, lack of resources (time and funding), Sparse descriptions – when applied and Personas not being integrated in the development.

Keywords—Personas, software development, questionnaire survey, grounded theory

I. INTRODUCTION

The common understanding of the Personas technique is, that a Persona is a description of a fictitious person [6, 21] based on data. The main way to represent a Persona is as a text describing the fictional user and a photo depicting the fictional user.

Looking at the related work four issues stand out: 1) it is reported that software developers lack knowledge and understanding of their users, their work, and goals [1], [3] 2) the Personas technique has been promoted as a strong tool for providing the software developers with a better understanding of the potential users [7] 3) several papers conclude that the use of Personas has been a success [10], [12] 4) the Personas technique is not necessarily an incorporated part of the toolbox in the software development industry [15] and the industry might have problems using Personas [2]. Our study will be related to these four issues in the discussion.

The literature provides several examples about what will happen if the Persona technique are used to its full potential. However, there are still unanswered questions about what it means if developers are not using Personas to represent their

user groups. Could this lead to: 1) software developers being unfamiliar with the user groups' actual needs 2) software without relevant features 3) less profit than if the software was developed to its full potential. Unfortunately, the literature does not provide much information about these speculations. Other aspects of Persona usage are also unexplored as so are whether other techniques are used instead of Personas.

The purpose of this paper is to explore to what extent software development companies use Personas and whether the industry uses the technique as proposed in the literature. The paper reports from a study in a defined region in Denmark and is part of a larger study on how the Personas technique is applied by software developing companies. This paper reports if companies in this defined region have had success using Personas and incorporating the technique as a part of their development toolbox. The greatest advantage of using one defined region is that it is possible to establish contact with all companies located in the region, which gives a more complete picture than picking out companies located in several regions or countries.

The following section presents a more detailed description of the work related to this study. It describes how Personas are constructed and used, including the pitfalls to avoid. Section 3 presents the methods used for data collection, which consisted of an online questionnaire with both open and closed questions. Grounded theory and coding were used for analysing the qualitative content of the questionnaire. Section 4 presents the results from the questionnaire. Section 5 provides a discussion of the results in a broader context. Finally, section 6 provides the conclusion.

II. RELATED WORK

The literature offers four different perspectives regarding Personas [18]: 1) Cooper's goal-directed perspective 2) Grudin, Pruitt and Adlin's role-based perspective 3) The engaging perspective, which emphasises how the story can engage the reader. These three perspectives agree that the Persona descriptions should be founded on data. However, 4) the fiction-based perspective, does not include data as a basis for Persona description, but creates Personas from the designers' intuition and assumptions. Even though the

Personas technique has been around for more than a decade, when comparing the four perspectives, it is still unclear what and how much background material is required to create Personas [17]. The common perceived benefits of Personas are two-fold: 1) when designing products the technique facilitates that designers remember that they differ from the end-users and 2) the technique enables designers to envision the end-user’s needs and wants. Furthermore, in the design process the Personas increase the focus on users and their needs. The technique is an effective communication tool, which uses the Persona description to acquire direct design influence and lead to better design decisions and definition of the product’s feature set [6], [7], [12], [13], [14], [16], [21].

Problems have been reported regarding creation and distribution of the developed Personas [2], [22]. The descriptions have been perceived as unreliable and not well communicated. Also developers lacked understanding of how to use the Personas [2], [21], [22]. The technique itself is criticised for being too founded on qualitative data and as a consequence of that - being non-scientific, being difficult to implement, not being able to describe actual people as it only portrays characteristics, and for preventing designers from meeting actual users [1]. Moreover, the unsolved question about how many users one Persona can represent is perceived as problematic [5].

Some have tried to prevent poor use of the Personas technique, e.g. Faily and Flechais [11] describes regularly sending information about the Personas to the team, to ensure that the designers and developers consider the Personas in the design process. They suggested that the creators should hand over instructions and provide tools that support the developers’ usage [11]. Problems in application are reported as also incorporating the mindset of the developers, which is documented by both Blomquist and Arvola [2] and Pruitt and Adlin [21].

In line with this, Matthews et al. [15] focussed mainly on designers and user experience professionals who had some training in Personas creation and had done extensive work with Personas used them as described by others [6], [21]. These designers had a very positive attitude towards the technique. Those who had done minor use of Personas had a moderate or neutral opinion regarding Personas, and those who had not worked with Personas at all had a negative or indifferent opinion regarding the technique.

III. METHOD

In order to study the usage of Personas we conducted a questionnaire study in 60 companies in a limited geographical area. We chose to focus on a well-defined geographical area in order to allow us to do as complete a survey with as many companies as possible. We made considerable efforts to identify and contact all companies in

the area. Had we chosen a larger area, the selection of companies would be more random. The aim of the study was to identify the level of knowledge about the Personas technique in a large proportion of the software companies in that area.

A. Participants

We focused on companies that were developing software, either for internal or external use. We ended up with software companies with the following characteristics:

The company develops software with a graphical user interface (e.g., mobile phones, games, web applications, PC or PDA software). The company develops software for customers or for internal use and is geographically located within a limited geographical area. The company employs more than a single person and it is not a hobby company.

To obtain a list with as many software development companies as possible we acquired two lists containing software companies located in the chosen region. These lists were from a previous study of companies and an industry network. This was followed by a search on Linked-In to include companies that only had a smaller development department in the region and had their headquarters located either in another region or in another country. Table 1 shows the process of obtaining the total amount of 134 software companies in the region, which was within the scope of this study.

TABLE I: OBTAINING A LIST OF RELEVANT COMPANIES

Lists to find the companies	Companies		
	Total number of companies on list	Out of scope or gone out of business	Applicable companies
List 1	77	-35	42
List 2	139	-63	76
Linked-in	16	0	16
Total number of applicable companies			134

B. Data Collection

We created an online questionnaire using the tool SurveyXact [26]. The first part of the questionnaire was made to gain more information about the respondent and his or her place of employment (e.g. job function, business, number of employees in the company and line of business, within software development). The second part was designed to acquire knowledge of if respondents knew what a Persona was and what it was used for. The third part was about the use of Personas in the companies. This part was only filled out by the people who answered that they knew of, and worked with, Personas. The questionnaire consisted of 35 questions, but only respondents who knew of- and

who is working with Personas in their current employment got to answer all 35 questions. The questionnaire consisted of both open and closed questions.

The distribution of the questionnaire was done in two ways. First, 43 companies in which we had a known contact person was contacted by phone. Then the remaining 91 of the 134 companies were contacted to acquire a contact person. This ended in 112 emails being sent out with a link to the questionnaire. Of the 22 companies that we did not send an email, eight had declined to participate and for the rest we could not locate a viable phone number or email address. The recipients were given three weeks to fill out the questionnaire survey. The data collection process resulted in 69 responses in total or a response rate of 51.5%. Of the 69 respondents nine did not finish the questionnaire, leaving us with 60 completed responses.

C. Data Analysis

Grounded Theory was chosen as analysis method because of its ability to help building theory, meaning that we could focus on keeping an open mind during the data collection process..

The aim of grounded theory is described as “*building theory, not testing theory*” [20]. This means that theory should emerge while the analysis takes place and should not be used to prove an already existing theory. Data analysis was conducted continuously while the questionnaire was still open for submissions, as described by Urquhart [24]. When the questionnaire was closed, the data was updated with the results from the latest incoming questionnaires. In the questionnaire we used both open and closed questions. To quantify the open questions, the grounded theory approach, as described by Corbin and Strauss [8], Urquhart [24] and Urquhart et al. [25], was used as an analysis method. All responses to closed questions was analysed quantitatively.

1) Open Questions

Coding was used to analyse the open questions. One question was: “*How would you explain what a Persona is and how it is used?*”. For this question the following coding categories were assigned: technique (for creating Personas), finding target user group, when in the process the Personas are used and how they are used. Grounded theory coding was not used for other open questions since the respondents mainly answered in very short sentences and they were sent directly to the end of the questionnaire when they answered “No”. E.g. “*Have you ever heard about Personas?*” or “*Have you ever worked with Personas?*” meaning that the number of respondents dropped for every question. As it makes no sense to ask a respondent about their knowledge about the use of Personas if they have already indicated they have never heard about Personas.

2) Closed Questions

Statistics was conducted directly from the closed questions. Results from both open and closed questions are being described in the following section.

IV. RESULTS

This section presents the results. The section is divided into two sub-sections. *Knowledge about the Personas technique* is referring to the first part of the questionnaire. This subsection reports if the Personas technique has been adopted by the software developing companies in the defined region. The second subsection *The understanding of Personas and their use* is dividing the obstacles of Personas usage into four main areas.

A. Knowledge about the Personas technique

The results of the questionnaire indicate that 27 out of 60 respondents, or 45%, have heard about Personas. Fifteen respondents out of 60 have worked with Personas. Seven respondents out of 60 are using Personas as a development tool in their current job. Meaning that 11.5% of the responding companies are currently using Personas as a development tool and 55% of the respondents have never heard about the technique. The distribution across different sizes of companies is shown in Table 2. In this table the dispersion across company size and the number of respondents familiar with Personas.

TABLE II: DISTRIBUTION ACROSS COMPANIES' SIZE

Number of companies	Number of employees				Total
	1-10	11-50	51-200	>200	
Using Personas	1	3	1	2	7
Not using Personas	23	16	8	6	53
Total	24	19	9	8	60

In Table 3 the 53 responding companies that do not use Personas have been grouped. It shows that 33 respondents have never heard about Personas. Three of the organisations did use Personas at some point but stopped.

TABLE III: RESPONDENTS' KNOWLEDGE ABOUT Personas – FROM COMPANIES THAT DOES NOT USE THEM.

Knowledge about Personas	Number of employees				Total
	1-10	11-50	51-200	>200	
Never heard about Personas	18	7	6	2	33
Have used Personas, but stopped	2	1	0	0	3
Heard about Personas, but don't use them	4	5	2	2	13
Worked with Personas in other employment or while studying	1	2	0	1	4
Total	25	15	8	5	53

One respondent stated they used Personas in a project where they collaborated with a group of university students, but did not find the Personas technique useful for other projects. The other two respondents stated that their respective companies stopped using Personas because they did not find the developed Personas applicable in their line of development. 13 respondents stated they had heard about the Personas technique but had never worked with creating Personas themselves and four respondents had worked with creating Personas in an earlier employment or while studying.

B. Understanding of Personas and their use

An open question in the questionnaire was applied coding to reveal all the participating companies' understanding of the term "Persona". "Personas being an imaginary user", were expressed by 22 respondents. e.g. "a fictitious user of the system you are developing". "Personas are used as a validation of the design", were expressed by 17 respondents. e.g. "making sure user needs are met by a given design".

A Persona "being a representation of a larger user segment" was expressed by 13 respondents, e.g. "description of a set of characteristics characterizing a certain group of users' behavioural patterns". And Personas "being a tool for making sure to keep the users and their needs in mind all the way through the development process" were recognised by four respondents. e.g. "...the Personas are used as focus points for planning the entire product life cycle". This means that Personas by far are recognised as fictionalised users used as a tool for designing features requested by users and user segments. On the other hand no more than four respondents expressed that Personas should be used through the entire development cycle. This means that the common idea seems to be that Personas are mainly a tool for identifying some aspects of the user group and not so much a tool to be used during the entire development process.

1) Lack of Knowledge (of the technique)

Lack of knowledge about the Personas technique seems to be a major obstacle regarding usage of Personas as shown in table 3. The analysis showed that 55% of the respondents had never heard about the concept or technique. Of the respondents who had never heard about Personas, 10 people were CEOs, owners or partners (primarily in micro- or small sized companies), five were managers in IT and three worked as sales managers (all three in medium sized companies). In table 4 the respondents job titles has been divided into smaller groups based on whether the company is currently working with Personas, or not.

This indicate that the chance of allocating resources to Personas development might be slim. One respondent indicated that the company did not recognise the importance

for any communicative tools. "The company has downsized and has eliminated the communications position since it is primarily a production company and they don't really understand the importance of e.g. Personas, ambassadors, first movers, e.g. or communication in general for that matter". This means that in these companies the knowledge about the Personas technique will not come from management, and even if employees bring the knowledge about Personas into the companies funding will probably not be allocated. On the other hand as seen in table 4, in the seven companies currently working with Personas four respondents was CEO, CTO or owner.

TABLE IV: DISTRIBUTION OF JOB TITLES OF RESPONDENTS

Job function of respondents	Not working with Personas in current employment	Company currently working with Personas
CEO, CTO, Owner	12	4
System Developer / Consultant	11	1
Project / Product / Sales Manager	16	0
Business architect / Communication and PR	8	0
UX / Web Designer / Manager	6	2
Total	53	7

2) Lack of Resources (time and funding)

The analysis found that Personas are mainly created if a need has been localised for a specific project and "cutting a corner" when using Personas seems to be the general idea. Some only use Personas to the point that they think it creates value for the customer and thereby, profit for the company. Also, when asked in the survey how much resources were allocated to develop Personas, the general answer was zero.

3) Sparse descriptions

When a Persona is created too superficially the Persona will lack the depth that would normally be the strength of the technique, making the Personas untrustworthy and unusable. This contradicts with what helps making Personas useful tools that lead to better design decisions [6], [13], [14], [16], [21]. When a Persona is created with much detail and described as a whole character, and not a stereotype, it will support the design and innovation process.

One respondent indicated difficulty in finding a suitable template for the descriptions and that they wanted to create short descriptions instead of detailed character descriptions. "It is hard to find good templates for constructing Personas. We ended up with a few lines in bullets describing each Persona, which could be used as a fast reference. Instead of a large scheme describing lots of details nobody wanted to read anyway". This corresponds with the descriptions of

Personas by some respondents answering the questionnaire. These descriptions were quite superficial and did not describe individual Personas but mainly a job role and a use situation.

4) *Not integrated in the development*

This ties-in with the finding of lacking resources. The superficial Personas are created to be used in the design process. The descriptions are not meant to be used in any other stages of the design process. Furthermore, they are not used to keep reminding neither developers nor designers about the end-user's and their needs. This means that the potential of the Personas technique is not explored.

C. *Advantages of using Personas*

The respondents currently using Personas described why their companies are using Personas as follows: *"to support the development of a system that is easy to use for types of user...It is very important for us that the system will be very easy to use, which is why a mapping of the various user groups is important"*. Another respondent stated: *"Internally in the company Personas are used to communicate characteristics of the customer segments that we want to focus on especially"*. Yet another respondent stated that Personas are primarily used for *"optimizing the product"*. These advantages corresponds with the advantages identified in the related work section.

V. DISCUSSION

Next, the results will be discussed in relation to the four issues located in the related work: 1) software developers lack knowledge and understanding of their users, their work, and goals [1], [3] 2) the Personas technique has been promoted as a strong tool for providing the software developers with a better understanding of the potential users [7] 3) several papers conclude that the use of Personas has been a success [10], [12] 4) the Personas technique is not necessarily an incorporated part of the toolbox in the software development industry [15] and the industry might have problems using Personas [2].

A. *Lack of knowledge and understanding of the users*

Software developers lack knowledge and understanding of their users, e.g. their work and goals [1], [3]. Among our findings was poor application of the technique. This relates perfectly to the first point about developers lacking knowledge and understanding of the users, since the Personas' descriptions, if applied, are made sparse and only used in a very narrow time frame of the development process. One of our findings was that the development of the Personas lacked resources, since none of our respondents had a budget allocated specifically for the Personas development. This goes against the related work stating that Personas can lead to better design decisions [6], [12], [13], [14], [16], [21].

B. *Personas can help developers understand users*

The Personas technique has been promoted as a strong tool for providing software developers with a better understanding of the potential users [7]. In our questionnaire and the section in this paper describing the advantages of using Personas, it was indicated that the most useful thing when using the Personas technique was that Personas helped the team share a specific and consistent understanding of several, different user groups. Which can lead to another advantage of product optimization.

C. *Personas used as a successful tool*

Several papers conclude the use of Personas has been a success [10], [12]. This corresponds with the experiences of our respondents who are using Personas. The tool is described as useful to help developers understand the users and their needs, especially if the system needs to be usable for several different types of end users. Some respondents that are using Personas identified most challenges for creating Personas. e.g. *"it can be hard to find templates for creating Personas."* another respondent stated that *"it is a challenge to map all user groups without asking all costumers"*. These obstacles has to be solved before Personas can be applied as a useful tool.

D. *Personas are not incorporated in the industry*

The Personas technique is not necessarily an incorporated part of the toolbox in the software development industry and the industry might have problems using Personas [2]. Since only 44% of our respondents have even heard about the Personas technique and less than 12% have worked with creating Personas, it is fair to say that Personas are not an integrated tool in the software development industry in this region. Also, we found that only four respondents indicated that Personas should be used through the entire development process, meaning that even if Personas are used, they are not necessarily used to their full potential. In companies using Personas, the technique is used mainly to identify types of users or use cases.

The Personas are kept to a minimum and not focused on describing whole characters. As in the related work we found developers lacking understanding of how to use Personas to gain most from their usage [2], [7], [22]. The reasons for that could be a combination of several aspects. We found that resources are not allocated specifically for creating Personas, which corresponds with the area of usability in general [1], [22], [23].

The full potential of Persona usage does not seem to have caught on in the industry. Matthews, Judge and Whittaker [15] found a connection between on the one hand the perception of Personas and on the other hand to what extent the technique was used and the amount of training the developers had had using Personas.

VI. CONCLUSION

The purpose of this paper was to explore to what extent Personas were used by software development companies in a limited geographical area and whether they used Personas as proposed in the literature. To accomplish this, we conducted a questionnaire survey with usable responses from 60 software development companies.

The study showed that only 7 out of the 60 software development companies used Personas. The results from the questionnaire also uncovered four issues. Lack of knowledge of the technique as such and lack of resources both related to companies not using the Personas technique. Sparse or badly designed descriptions or not being part of the development process both related to poor application, when using the technique.

Our findings are well linked to other studies described in the related work section. Yet our study contributes with a new angle by focusing on making a complete study within a limited geographical area we now have a pretty good idea about if the Personas technique is an integrated tool in software development in this geographical area. We have not been able to find related work that has done a similar study in another country. This means that this paper is the first paper indicating whether Personas are used for developing software at the industry.

The main limitation on our results is that we focussed on a limited geographical area. This was necessary to achieve a high level of coverage of all companies in that area. The alternative would have been less coverage by including the same number of companies but from a larger geographical area. As future work it would be interesting to learn more about the advantages of using Personas. This area still needs further study even though some advantages have been identified in this paper, also it would be interesting to learn if companies that do not use Personas are using another tool instead.

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