

The use of personas in software development: Advantages, obstacles and experiences in practice

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Abstract. Personas 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 the knowledge about the method and the usage of personas in software development companies. It was conducted in a small geographical area to establish if personas is a widely used method within all companies in the chosen region. The purpose of the questionnaire survey was to determine whether software development companies in that area used personas during the development process. The questionnaire was answered by 69 companies from the chosen region. Several issues were identified as reasons for not either not using the method or for poor application of the method. For companies not using the method at all we found two obstacles; lack of knowledge about the method and lack of resources. For companies using the method, we found additionally two obstacles; Sparse or badly designed persona characters or personas not being used in the entire development process.

Keywords: Personas, software development, questionnaire survey, grounded theory.

1 Introduction

Looking that 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 persona method 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 persona method 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 personas method 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 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 provide not much information about these speculations. Other aspects of persona usage are also unexplored.

The purpose of this paper is to explore to what extent software development companies use personas and whether the industry use the method as proposed in the literature. The paper reports from a study in a defined region in one country (blinded for review) and is part of a larger study on how the persona method is applied. This paper reports if companies in this defined region have had success using personas and incorporating the method as a part of their development toolbox.

The greatest advantage of using one defined region is that it is possible go get in touch 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 was used for analyzing 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.

2 The method and usage of personas in related work

The common understanding of the persona method 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.

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 emphasizes 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 basis for persona description, but creates personas from the designers' intuition and assumptions. Even though the persona method 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 method facilitates that designers remember that they differ from the end-users and 2) the method 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 method is an effective communication tool, at the persona description get 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 method itself is criticized for being too founded on qualitative data and as a consequence of that - 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 method. 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 supported use by suggesting letting the creators hand over use 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] found that mainly 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, 7, 21, 22]. These designers had a very positive attitude towards the method. Those who had a minor use of personas had a moderate or neutral opinion regarding personas, and those who had not worked with personas had a negative or indifferent opinion regarding the method.

3 Method

In order to study the usage of personas and the obstacles towards the prevalence of the method we conducted a questionnaire study. First we conducted an online questionnaire survey and secondly we analyzed the answers of the open questions using Grounded Theory [8].

3.1 Participants

We focused on companies that were primarily developing software, either for internal or external use. We decided to exclude companies that focused solely on hardware development. 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 for customers or for internal use.
- The company is geographically located within a specific minor geographical area .

- The company employs more than a single person and it is not a hobby company.

We chose to focus on a well-defined geographical area in order to do as complete a survey as possible and finding the level of knowledge about the personas method in that area.

To obtain a list with as many software development companies as possible we acquired two lists containing software companies located in the defined region. This was followed by a search on Linked-In to include companies that only had a smaller development department in the region and had the headquarter 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 1. Obtaining a list of relevant companies

	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

3.2 Data Collection

We created an online questionnaire using the tool SurveyXact. (www.surveyxact.com). The first part of the questionnaire was made to gain more information about the responder 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 made to get statistics on the number of responders who knew what a persona was and what a persona was used for. The third part was about the use of personas in the companies. This third part was only filled out by the people who answered that they knew of, and worked with personas.

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 134 companies was contacted to acquire a contact person. This ended in 112 emails sent out. Of the 22 companies that we did not send an email with a link to the questionnaire, eight 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 survey.

The data collection process resulted in 69 responses in total or a response rate of 51.5%. Of the 69 responders nine did not finish the questionnaire, leaving us with 60 complete responses.

3.3 Data Analysis

The aim of grounded theory are 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.

The data analysis began before the questionnaire was closed. 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] was used as an analysis method. All quantifiable data was analyzed quantitatively.

Coding was used to analyze the open questions. The most interesting question to use coding on was “*How would you explain what a persona is and how it is used?*”.

For this question the following coding categories were assigned; method (for creating personas), finding target user group, when in the process the personas are used and how they are used. Coding was not added successfully to other open questions since the respondents mainly answered in short sentences and respondents were sent directly to the end of the questionnaire when ever 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. Since 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.

4 Results

This section presents the results obtained from the questionnaire study.

4.1 Knowledge about the personas method

The results of the questionnaire indicates that 27 out of 60 respondents or 45% have heard about personas. 15 responders out of 60 have worked with personas. Seven responders out of 60 are using personas as a development tool in their current job. Meaning that 11.5% of our responding companies are currently using personas as a development tool and 55% of the responders have never heard about the method.

The distribution across different sizes of companies is shown in Table 2. In this table the dispersion across company size and the number of responders familiar with personas.

Table 2. Distribution across companies size.

Number of employees	1-10	11-50	51-200	>200	Total
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. of university students, but didn't find the personas method useful for other projects. The other two respondents stated that their respective companies stopped using personas because they didn't find the developed personas applicable in their line of development. 13 respondents stated they had heard about the personas method but had never worked with creating personas themselves and four respondents had worked with creating personas in an earlier employment or while studying.

Table 3. Respondents knowledge about personas – from companies that does not use them.

Number of employees	1-10	11-50	51-200	>200	Total
Never heard about them	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

4.2 Understanding of personas and their use

An open question in the questionnaire was used to reveal all the participating companies understanding of the term “persona”. Figure 1 shows the distribution among four categories of understanding. “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” were expressed by 13 respondents, e.g. *“description of a set of characteristics characterizing a certain group of users' behavioral 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 recognized 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 recognized as fictionalized 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. Which 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.

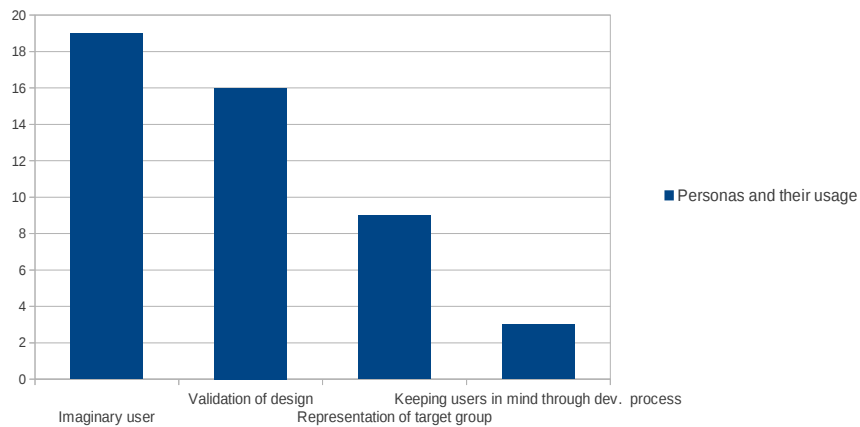


Figure 1 . How respondents described personas and their usage

Personas in use. Respondents who did use personas in their company described several strengths of using personas in the development process.

One described it as being a useful tool to support that a system is usable by all user types; “..it is very important for us that the system is very easy to use, which is why mapping the user types are important”. Another respondent claimed personas was used primarily because their supplier suggested they should. However they do see the need for using personas as they are designing for many different purposes and lots of different users.

Personas were also described as being usable for clarifying constructs.

In one of the closed questions the respondents using personas were asked to indicate why they found personas to be a useful tool. Of these, three responders indicated personas helped the team sharing a specific and consistent understanding of several, different user groups. Two respondents indicated personas are useful for guiding suggested solutions to match the user needs. Two respondents indicated personas was useful to help developers keep focus on the users since they turn users into real people. Two respondents indicated personas being useful for understanding the business area of the system. Finally one responded that personas could help the team understand how the product should be marketed and sold.

4.3 *Knowledge about – and experience with personas*

In our study, several issues were identified as the reason for either not using the method or for poor application. We decided to categorize the issues as follows:

Not using the method:

- Lack of knowledge about the method
- Lack of resources

Poor application:

- Sparse or badly designed descriptions
- Not integrated in the development process

Lack of knowledge (of the method). This seems to be a major obstacle regarding usage of personas, the analysis showed that 55% of the respondents had never heard about the concept or method.

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). This could indicate that the chance of allocating resources to personas development might be slim.

One respondent indicated that the company did not recognize 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 method will not come from management, and even if employees bring the knowledge about personas into the companies funding probably not being allocated.

Lack of resources (time and funding). The analysis found that personas are mainly created if a need has been localized 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.

Sparse descriptions. When a persona is created too superficial the persona will lack the depth that would normally be the strength of the method, making the personas untrustworthy and unusable. This contradict with what helps making personas a useful tool that lead to better design decisions [6, 12, 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.

Not integrated in 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 method is not explored.

5 Discussion

Next, the results will be discussed in relation to the related work.

5.1 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 method. This relates perfectly to the first point about developers lacking knowledge and understanding of the users, since the persona's 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]. If personas are created without more than use-related details, at best it will not create any value at all. Or it could lead developers down a wrong path.

5.2 Personas can help developers understand users

The persona method has been promoted as a strong tool for providing software developers with a better understanding of the potential users [7]. In our questionnaire it was indicated that the most useful thing when using the personas method was that personas helped the team share a specific and consistent understanding of several, different user groups.

5.3 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.

5.4 Personas are not incorporated in the industry

The persona method 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 method 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 method 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 the 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 the perception of personas and to what extent the method was used and the amount of training the developers had had using personas.

6 Conclusion

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

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

Our findings are well-supported by other studies described in the related work section. Despite this, our study contributes differently than the ones described in the

related work. Since this study is focusing on making a complete study within a limited geographical area.

As future work it would be interesting to get more than one employee from each company to fill out the questionnaire. This might show a different result since different employees could have a different understanding of personas and their use.

Follow-up interviews could also be interesting. This type of study could end up providing enough information to disseminate the knowledge about the personas method and their usage.

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