A Study on the Use of Personas as a Usability Evaluation Method

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Abstract: The user modelling technique known as personas has obtained excellent results over the last years. Literature about this theme shows different forms of using the concept of personas in the moment of software conceiving, however, the good results obtained with this technique allow to catch a glimpse of a more diverse use of this method. In this context, this study performed a usability evaluation method of Facebook's privacy configurations, the most popular social network worldwide, aiming to verify the use of the personas concept as a usability assessment technique.

1 INTRODUCTION

The main hypothesis of this study is that the personas technique can be well used as a usability evaluation method, especially for the context of usability assessment of systems that have a large variety of user profiles. The small amount of studies about the use of personas as an evaluation method and the good results obtained with the use of such technique in the conceiving of systems were driving for this research.

In this context, the personas technique was used to assess the usability of Facebook's privacy configurations, and also, to compare the results obtained with the use of this technique with the results obtained in a pilot study in which the method used was the query application task script and that also assessed the safety configurations of this social network.

The choice for assessing the usability of a social network's configurations took place considering the huge variation of the users' characteristics. Accessing social network websites became part of everyday life of a large amount of people. Whether the objective is to keep contact with friends and family, establish a network of people with common interests or even professional contacts, many resort to one or more amongst the many social networks available. The choice for Facebook was due to its larger popularity when compared to other social networks (Arbor, 2012).

The use of a social network usually implies sharing pictures, videos and a range of other information and data by the user and it is up to the user to use the different resources available in these networks to line the access to its profile information.

Therefore, it is important to verify if the configuration tools, especially the privacy configurations, are adequate to the users' needs and expectations. The observation of such demand strengthened our decision to assess Facebook's privacy configurations usability.

2 PERSONAS

According to Cooper and Reimann (2003), personas are realistic and representative information compositions that include fictional details for the user's more complete characteristic. The composition of the persona can be based on imagined information, demographic and biographic features of the modeled persona. Personas have names as real people and can be represented with an image, by a picture to add realism.

In a simple way, persona is a user profile modelling technique of systems or products, representing the target, describing one or more characters with data and features (Pruitt and Adlin, 2006).

In "Uma Avaliação do Orkut utilizando Personas sob a ótica da Nova Usabilidade", the authors developed a work aiming to assess the usability of Orkut social network through the use of personas (Madeira et al., 2008). Two personas were developed so that the assessment could be

performed. In their considerations, they stated that the use of the concept of personas made it easier to select the users that were in the use scenarios and led to a larger understanding about them, which led to a better quality of the proposed study, being possible to foresee details that were left unnoticed just using appliance of quantitative analysis (case study).

3 PILOT STUDY

In mid-2012, a pilot study was developed about the Facebook's privacy configurations usability evaluation by the author of this study in partnership with Glauce Rodrigues Borges Teobaldo, with orientation of Professors Cristiano Maciel and Patrícia Cristiane de Souza (Borges et al., 2013) .

The observation that Facebook is a social network used by people of many different ages and in which different generations have different capabilities and difficulties generated a suspicion that Facebook's privacy control tools could not be adequate for the many different generations of users.

The interest on generations X (people born between 1965 and 1976) and Y (born between 1977 and 1997) (Tapscott, 2010) came from the consideration that the difference between these two generations on the contact that each had with information technologies throughout life could lead them to different understands about Facebook's privacy configuration tools. It is a fact that, in spite of what happened to generation X, generation Y lived with them since childhood. However, generation X is also technology user and is very much inserted in the social networks. Therefore, the research had the objective to investigate the adequacy of the privacy control tools to the needs of generations X and Y's needs through a quanti-qualitative assessment using monitored user tests.

3.1 Methodology of Pilot-study

The study was performed by the application of a task script and user questionnaire of the so-called generations X (born between 1965 and 1976) and Y (born between 1977 and 1997) (Tapscott, 2010) and aimed to investigate whether or not Facebook's privacy control tools are adequate for both the generations.

Usability tests were performed with twelve real Facebook users to evaluate the social network's privacy control tools, being six from generation X and six from generation Y.

The tasks proposed in the script focused on the most relevant privacy functions for users associated to the exposure of personal information and pictures and messages sharing.

The assessment with the users was split in three steps. First of all, the users signed a free and clear term of consent, according to Resolution 196/96 of the National Health Council, that regulated, at the time, the researches using humans in Brazil (Brasil, 1996), later, using their own Facebook profiles, performed the tasks, later on answered to a survey that asked for information on their social profiles (such as year of birth, gender, schooling, time and frequency of Facebook access), their impressions about the tasks performed and the functionalities assessed and had subjective questions in which the user could describe the difficulties found in each task and suggest enhancements in the approached functionalities. The execution of the tasks was monitored by using the free software FreeScreen Video Capture (Top View Soft) for later observation of user interaction. This allowed the researchers to compare the impressions formed by the users in the survey with their real task performance.

The objective of this pilot-study was to investigate if Facebook's privacy control tools are adequate both for generation X and generation Y users. The difference in the number of tasks from the script performed successfully and the difficulties observed during the performing of these activities showed that the social network's privacy configurations are not easily understandable for both the generations.

The study discussed situations in which the tools' usability needs to be assured to minimize the difficulties found by users, especially those from generation X, in their information' privacy configurations. It was possible to realize, through the analysis of the tests performed with this sample, that one behaviour difference between the generations is in the way of performing unknown tasks. Generation Y users found it easier to search the privacy configurations when they were unknown, for they felt more driven and searched for different ways to be able to perform the activity while people from generation X found it very difficult in the same situation, giving up easier and not looking for different ways to perform the task.

Other aspect that differs the generations is that generation X users access Facebook less than the users from generation Y, thus they have less time to try to understand some more specific configurations. The centring of privacy configurations will contribute to minimize such difficulties.

The research report points out that changes are

needed both in the naming as in placing and redesigning some privacy items in Facebook, in order to fulfil users' expectations for both generations.

The results obtained in this pilot-study were used as comparison to check if the concept of personas represents a good alternative as evaluation method.

4 PERSONAS AS EVALUATION METHOD

The Collaborative Systems Evaluation Methodology (Metodologia para Avaliação de Sistemas Colaborativos - MASC) created by Madeira *et al* (2008), was developed aiming to subside the research "Uma Avaliação do Orkut utilizando Personas sob a ótica da Nova Usabilidade'. It was elaborated specifically for the research aiming the need of a specific methodology to use personas in assessing collaborative systems.

The first activity of the Context Investigation step is to define the usability categories (easy to learn, effectiveness, easy to remember etc.) that will be observed. For this research, it was considered that this step was performed through the pilot-study in which there has already been defined the observation of usability related to Facebook's privacy configuration aspects, as well as some usability problems have already been identified and the users' behaviour has already been observed. The work performed in the pilot-study was even more wide and deep than the one suggested in Context Investigation. This is because in the pilot-study user tests and survey applications were predicted.

MASC was important to serve as a model mainly in the Quantitative and Qualitative Analysis and in elaboration of personas. Thus, all of the steps described starting from Quantitative Analysis were executed.

The questionnaire developed to identify Facebook user profiles identification was composed by twenty five questions, being the ten first aiming to raise information about the socio-demographic profile of users, while the remaining ones had as objective to know user behaviour concerning the studied social network. It was produced using Google Docs, which allows the creation, edition and sharing forms. Before application, the questionnaire was validated with three users with different profiles that spent from three to four minutes to fill the questionnaire. This time period served as base so that it could be informed the average filling time in presenting the questionnaire.

The questionnaire disclosure started on 12/17/2012 and the same remained available to fill until 12/26/2012. The survey was disclosed in Facebook, through the personal profile of the first author of this work through the link https://docs.google.com/spreadsheet/viewform? formkey=dDFJZ0xUMkFma3RfYnBkYUZia1hFYk E6MQ. During these nine days, the survey received one hundred and thirty four answers.

4.1 Personas Definition

Survey information tabulation for personas definition showed itself as the great challenge of this work. This is because the reference material found is not clear as for the exact form to obtain personas from system public data.

Aquino (2008) used data mining method through the tool Weka, being the clustering algorithm offered by the tool was used for user data grouping and personas composition. According to the author, the clustering model groups records in groups that possess similar features.

In this work, the choice was of a simplified approach keeping the focus on MASC steps. The users were grouped according to their socio-demographic information and were observed which behaviours and features are more common related to Facebook that differentiate these groups between themselves. From that, it was possible to characterize the personas using both socio-demographic information as well as the ones related to behaviour.

So, there were defined four user groups according to their age: those born between 1977 and 1988 (58% of the users), 1989 and 1997 (representing 23% of the users), 1965 and 1976 (with 13%) and 1998 - 2006 (5%). The group of those born between 1946 and 1964 were not enough representative so that it could be considered. Notice that the two first groups represent generation X, which correspond to 71% of the valid queries.

Therefore, the four age groups identified were used as starting point to tabulate the data and identifying of the other aspects for posterior characterization of the personas, as shown in Figure 1.

Figure 1 shows the raising of each demographic feature for age, so that it is possible to identify the dominant features for each aspect contained in the survey. It deals specifically with the age statistics of the ones born between 1977 and 1988. Observation of Figure 1 allows to define the socio-demographic features of this group as presented in Table 1.
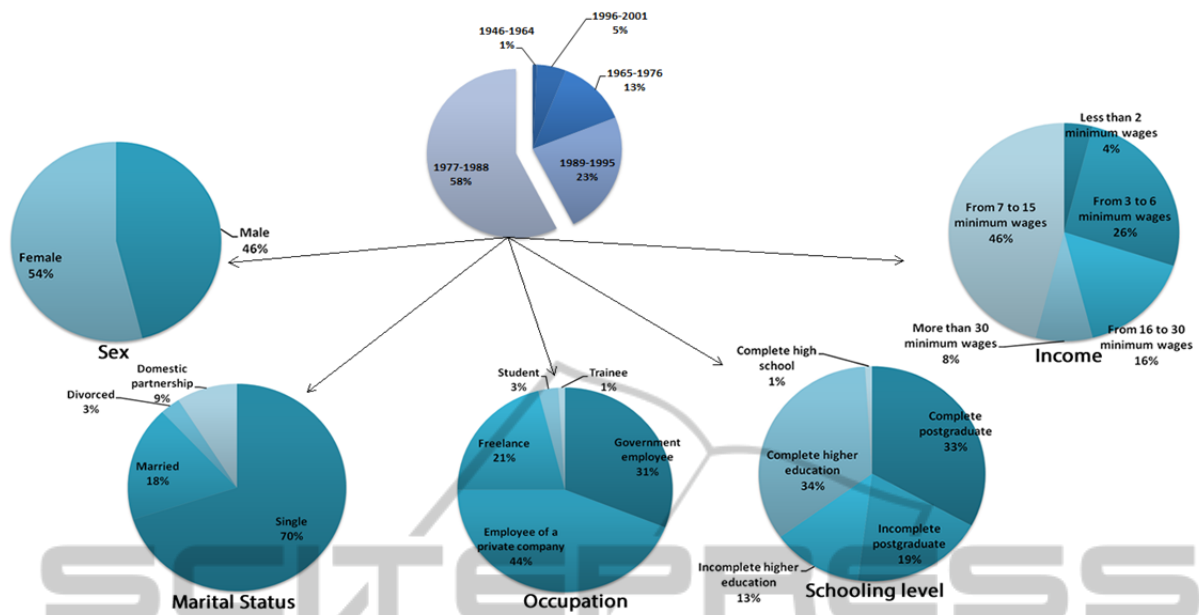
Figure 1: Socio-Demographic Features Statistics of the Users Born between 1977 and 1998.

About the survey information on Facebook, the characteristics definition was performed the same way: observing the options that repeated the most in the group answers.

Table 1: Definition of the characteristics of the users born between 1977 and 1988.

CHARACTERISTIC	DEFINITION
Age	Between 1977 and 1998
Sex	Feminine
Relationship status	Single
Occupation	Private company employee
Schooling	University degree
Income	From 7 to 15 minimum wages

Figure 2: Persona - Júlia.

With the characteristics defined it was possible to obtain a more thorough comprehension of the users about their habits and objectives for the studied social network and made possible to define four personas: Carol, Júlia (Figure 2), Rafael and Ana Maria.

4.2 Test Application

The methodology used in user's usability tests application was the same in the pilot-study, with the difference that after the filling of the survey, the participant was presented to the personas and invited to choose the one which best represented itself considering only the aspects related to Facebook use.

The scenarios applied in this research were the same used in the pilot-study and can be visualized in Table 2. Considering the characteristics of the persona Júlia, it was necessary to perform usability tests with underage users. In these cases, after reading the consent term for the participants, the signing of the document was done by their parents.

Usability tests were performed with twenty two users, five of them being with age, schooling and Facebook use features based on the persona Júlia, six with the features of persona Rafael, six based on the persona Carol and five similar to the persona Ana Maria.

As occurred in the pilot-study, to participate in the tests, the users signed a free and clear consent term, according to the resolution 196/96 (Brasil, 1996). In the same way, the execution of the usability tests was monitored as previously stated.

First of all, it was shown the evaluation proposal

to the participating users. This presentation aimed not only an introduction to the theme, but also to minimize the doubts concerning the performance of the tasks and ask the users (or parents, when dealing with underage users) the signing of the consent term.

After the presentation, the participants have done the usability tests trying to execute the tasks proposed in the script. After that, the participants answered to the after-test questionnaire, in which were asked information about the socio-economic profiles, Facebook use and about the proposed tasks

Table 2: Task script.

Task 1	Alter the privacy configuration so that your profile can no longer be accessed publicly through a search tool (for example, Google). Make it visible just for your friends.
Task 2	Did you know that it is possible to visualize your profile the way it shows to a friend and the way it shows to people who are not your friends? Try to visualize them both ways and check if your personal information and sharings are shown for both cases.
Task 3	Alter the privacy of your birth date so that it is shown only for yourself.
Task 4	Did you know it is possible to define the privacy of your albums and pictures making them visible only for your friends, for a group of people or to one single person? Do the test altering the privacy of a profile picture so that one only friend can visualize it.
Task 5	It is possible to choose who can publish a message or share information on your profile or timeline. Alter your configuration so that only your friends can post on your profile.
Task 6	Alter the configuration so that you can analyze publications in which you were marked before they are shown on your timeline. Thus, every time you are marked on a picture or someone's status, the marking will be pending until you approve or refuse.
Task 7	In the box "What's on your mind"... (your name)?", publish a message and block one or more specific people from visualizing it.

in the script, informing their impressions about the tasks executed. The questions used in this questionnaire about the socio-economic profile and about Facebook were exactly the same used in the survey to identify the profile of Facebook users. This occurred so that it was possible to exactly compare the characteristics of the personas (that were defined based on the information obtained from the profile identification survey).

At last, the participant was presented to the four exiting personas and indicated the persona they identified the most with, considering only the using aspects of Facebook.

For the participant to be considered adequate for the persona to which it would be associated, were defined some of the characteristics that could influence in the way the user interacts with the social network. They are: age (representing an age group and not a specific age), schooling (respecting a group), access frequency, use priorities and kind of posted content.

4.3 Video Analyses

So that it was possible to compare the results of the pilot study and the actual work, the tasks classification as "Performed", "Partially performed" and "Not performed" was maintained.

The analysis of the users' interactions during the performance of the tasks allowed to visualize the performance of the participants categorized according to the characteristics of each persona in performing the tasks.

In the period between the application of the pilot-study and the development of this research, Facebook made available many new functions and layout modifications, being many of them aiming to make privacy configurations easier. One of these new functions, made available in December 2012, is called "Privacy shortcuts". It is a menu that centres some of the privacy options, however it does so in a narrow way, since many of the important configurations, such as picture visualization configuration or profile information, are not in this shortcut.

This new functionality was used only by users similar to the personas Rafael and Carol (four and two users, respectively) that by coincidence were the personas with the best performance in the usability tests.

Yet another interesting aspect observed in the videos is that considering all of the users in which the usability tests were applied (including the users of the pilot-study), only one of them used the

Facebook help service in the attempt to fulfil the tasks. This user, similar to the persona Júlia, used the help service in different tasks, however, did not reach success in performing them.

4.4 Questionnaire Analyses

Since the user experience in using the system is a characteristic of great influence in defining the interaction quality between them, it is necessary to observe the level of expertise of the usability tests participants, separated according to the personas they are most close to. Thus, it was observed for how long the participants have a Facebook Profile and how frequently they access it.

It was verified that the users related to the personas Carol and Rafael are those who access the social network for longer, while the users related to the persona Júlia are those who have the larger number of participants that accesses Facebook on a daily basis.

Most of the users related to the persona Júlia has their profiles for less than a year, but access them daily. This characteristic draws attention, since, despite it is the persona with the largest number of users that access the social network daily, during the video analyses, it was understood that the persona did not perform any of the tasks completely, which could be an indicator that the privacy configurations are not adequate for the children using Facebook. In this case, it is important to remind that the minimum age this social network requires for underage users is thirteen years old, thus being the configuration options and functions descriptions must be in an adequate language to this kind of audience.

In relation to the users similar to the Persona Ana Maria, it was noticed that these are the participants with the lower percentage of Facebook daily use, which could contribute to the difficulty in executing the tasks proposed in the usability test.

Another important aspect that is influential over the way the users can interact with the system over privacy configurations is related to the type of content that the user posts, that being, whether or not the user needs to know the privacy configurations according to the type of content that it usually publishes on its profile.

It was observed that the users more similar to the persona Ana Maria usually (or almost completely) post only content that they consider public. This characteristic goes along with the aspects defined for the persona based on the survey answers. The questionnaire analysis also showed that despite the corresponding users to the persona Rafael had the

best performance in executing the privacy configuration tasks, none of them is used to, when using their profiles, configure private content, preferring to use the Inbox, publishing only public domain content or even posting public and private content without any configuration.

Another fact observed during the analysis of the queries is that although it has not done 77% of tasks, most participants associated with the persona Julia replied to the question "Have you had any trouble finding where to make proposed settings?" with the option "Yes, in few.". Another finding is that the persona with the best performance on the usability test is the one that considers the privacy settings offered today by Facebook sufficient considering that the majority of users associated with that persona answered "No" to the question "I wish you had more privacy options beyond those offered by Facebook?". This may mean that other users may be missing settings that actually already exist, but that they may be unaware.

As in the pilot study, the subjective questions in the questionnaire provided some relevant considerations, in particular suggestions for the improvement of the privacy settings of the social network.

The P6 user argues that some settings could be better explained at the time of creating the profile, because although it was able to perform all tasks whose existence is not known configurations exist, such as the possibility of disabling access to the profile by using a searcher.

The user opinion P7 is that privacy settings should be located in one place so that they are centred. Similar view was presented in the pilot study by a user and the generation Y was considered relevant in order to monitor the implementation of the tasks showed that some users (especially users of generation X) tried to perform all requested privacy settings in script across the "Privacy Settings", which was not possible since the settings of various items were "scattered" by the Facebook interface option.

Setting the visibility of each photo, for example, is performed on the album himself, and visibility of publications in general, is selected at the time of publication. As for this problem, although Facebook has recently implemented a feature called "Privacy shortcuts", which centralizes some privacy options (as suggested in the pilot study), it does not do so comprehensively, considering that important settings such as viewing pictures or profile information, are not contemplated in this shortcut. Execution of the tasks also showed that still are few the users that use

such option.

User P5 states that it has found it difficult to execute the first task (which asked to deactivate the profile access permission through search engines), for, according to it, the location of the function is not intuitive. In the pilot-study, this issue was one of the most problematic for the users and in that occasion was suggested not only to modify the name of the option, which by the time was called "Public Previous", but also its location within the available menu options. Both modifications were performed in a way that nowadays this setting is within Privacy Configurations, as part of the sub item "Who can search me?" with the name "do you wish other search engines to show a link in your timeline?". However, even with all of the modifications, the user P5 still found it difficult to locate the option.

5 DISCUSSIONS

Before establishing any comparison between the research methods used in the pilot-study and in the actual work, it is important to understand the difference of the target of each research. In Figure 3, it is possible to visualize such difference of target considering just the age feature, however, it is important to remember that each persona represents a set of features as socio-economics as Facebook-use related.

Figure 3 shows that while the pilot study was performed focusing on the users of generations X and Y, the actual work considers the users of generation Z [15], besides subdividing the users of generation X in two user groups with different features to identify the behaviour difference within a same generation as privacy settings are concerned.

	Pilot Study	Generation Y (77-97)		Generation X (65-76)
Personas	Júlia	Rafael	Carol	Ana Maria

Figure 3: Users researched: Pilot-Study x Actual work.

The difference between users of the same generation, represented by Rafael personas and Carol, becomes clear when we analyzed the numbers that demonstrate that similar to the persona Rafael users had an almost 20% higher than the performance of the users associated persona Carol which shows the influence of factors other than age in the way users interact with the system and the privacy settings.

Regarding the use of personas as a method of evaluation, empathy, so widely discussed when

dealing with this concept, was easily identified at the time that users have contacted the description of Julia, Rafael, Carol and Ana Maria profiles. Some stated "This one is me." about the description of one of the used archetypes.

The application step that asked the user to inform which persona it was more similar to as for Facebook use was important so that it was possible to verify if the participants identified themselves with the personas they would be associated with. In most of the cases, the participants chose for their respective persona.

Pruitt and Adlin (2006) states that the use of personas during the developing process leads to an increase in usability, utility and product appeal, enhances the processes and improves the ability of the team to take business decisions that can benefit both itself and the users. Thus, considering that the process of developing a system is similar to the maintenance process, it is possible to conclude that the definition of the behaviour of personas and identifying their difficulties in using the application enables the upkeep or redesign the interface to be the same facilitated.

Thus, we can conclude that the main difference in the methods used in the pilot study and the current study is that the use of personas as a method of evaluation allows the creation of complete artefacts to use in the next step to readjust and adapt the system according with the problems encountered.

6 FINAL CONSIDERATIONS

The use of Facebook increases every day among the different profiles of users worldwide. Adjust your privacy settings throughout the audience means that not only minimize unpleasant to those who use the social network due to exposure problems, but can also function as an efficient way to retain the user consequences.

The constant changes in Facebook's privacy settings perceived throughout the development of this work, including the implementation of the pilot study show a concern of the owners of the system to meet the needs of its users, if readapting and remodelling itself is always possible, in order to stay up to date.

Privacy issues are pertinent to every social network and not only to Facebook. The methodology of queries, development of personas, implementation of task scripts and consequent usability assessment and proposed changes of items with problems, can be applied to any other social

network.

The development of this work generated great experience about usability assessment. The observation of many concepts and methodologies was needed so that all of the developed steps could generate satisfying results for the next step.

Thus, some lessons should be observed for future work , including the following: watch the language used on quizzes and tests is available to the entire universe of people with whom they will be applied (in the case of this study , it was found that younger users had great difficulty in completing both the questionnaire to identify a profile of Facebook users as the post-test questionnaire), to avoid as much open questions in the online questionnaire and lastly, try to make usability tests and questionnaires post-test more succinct so as not to overwhelm the users and be able to extract information from him and important ideas on issues at hand.

Support the dissemination of Persona user modelling can contribute to that produced systems are more suited to the desires of an audience of technology that is becoming more demanding every day. Furthermore, the use of personas as a method of assessment contributes to the diversification of the existing methods and that evaluations of usability and interface can be even more comprehensive.

This research can be seen that the use of personas as a method of assessment does not contribute significantly to the identification of usability flaws step, but it seems to be very effective when you correct them in view of the artefact that can be delivered to maintenance staff and design (complete personas representing tracks market that are based on real user data and have identified difficulties and suggestions for modifying the system) and empathy created on the development team for individuals who personas represent.

Thus, future studies can examine the process of redesign and fix usability flaws based on personas created and used during the evaluation methods and the benefits that this type of evaluation can bring to this process step.

The complete work that supported the development of this article can be found in Cerqueira (2013). In it, it is possible to visualize more deeply the matters approached here.

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