Poster: "Adoption of the Visual Brainstorming Technique in the Open Source Software Development Process"

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ABSTRACT

The growth in the number of non-developer open source software (OSS) application users and the escalating use of these applications have both created a need for and interest in developing usable OSS. OSS communities are unclear about which techniques to use in each activity of the development process. The aim of our research is to adopt the visual brainstorming usability technique in the HistoryCal OSS project and determine the feasibility of adapting the technique for application. To do this, we participated as volunteers in the HistoryCal project. We used the case study research method to investigate technique application and community participation. We identified adverse conditions that were an obstacle to technique application and modified the technique to make it applicable. We can conclude from our experience that these changes were helpful for applying the technique, although it was not easy to recruit OSS users to participate in usability technique application.

CCS CONCEPTS

Human-centered computing Interaction design; Open Source Software.

KEYWORDS

Open Source Software; Usability Techniques; Requirements Engineering; Develop Product Concept; Visual Brainstorming.

1 INTRODUCTION

The usability technique definition and integration into OSS projects is a complicated process, about which there are few papers [6]. These papers suggest that usability techniques should be reconceptualized, but they do not explain how the OSS community should go about adaptation. However, the issues to be taken into account to adopt such techniques in OSS developments are unclear. There are few studies have reported the application of the visual brainstorming (VB) technique in OSS projects [3,6] . In the Carrot2 project, the original application was redesigned according to its target end users [3]. The VB technique was applied as prescribed by HCI [3]. However, the VB technique reported by Terry et al. [6] was adapted for adoption to develop a bit map graphics application. In the adapted technique, ideas were gathered using a wiki instead of at face-to-face meetings as established by HCI. Thanks to the wiki, anybody involved in the project could put forward his or her interface design ideas. This paper addresses the research problem of how to adopt the VB usability technique [7] within the OSS development process. To do this, we previously identified which problems had to be solved in order to be able to apply the technique. We chose the VB technique because the use of this technique in the process of designing the User Interface (UI) has several benefits: it generates creative ideas in the process of solving specific problems, with one hour of session they obtain positive results, supports conceptual design by generating metaphors for UI architectures and providing new ways to implement old functionalities [7].

This paper is organized as follows. In Section 2 we describe the proposed solution. In Section 3 we report the results and discussion.

2 PROPOSED SOLUTION

In our research, the collected data nature is qualitative (texts, images, documents). We used a case study as the qualitative research method to validate our research. This research method is used when the phenomenon under investigation (in this case, the adoption of an adapted usability technique) is studied within its real setting (in this case, an OSS project).

Since the VB technique is related to requirements engineering for product concept development, we looked at projects with a low level of coding (that is, projects where key features were still being added) that were not overly ambitious and were at the very early development stages (alpha version) in order to select a suitable OSS project in which to adopt the selected usability technique. Considering the above, we selected the HistoryCal OSS project. HistoryCal is a calculator designed to work with different world calendar schemes, calculating date ranges and ages based on these calendars. As shown in Fig. 1 (a), HistoryCal's graphical UI has a lot of room for improvement. HistoryCal has a single developer.

The VB technique cannot be applied directly, that is, as is prescribed by HCI, in OSS development projects because the OSS community has characteristics that are uncommon in the HCI world (e.g. a code-focused vision of the world and a limited resources). In addition, OSS users are characterized mainly because they collaborate voluntarily. As a result, recruiting and retaining new members is a critical success factor for an OSS project [1]. Even though usability techniques demand conditions that, as a rule, OSS projects cannot meet, the techniques can be adapted to bring them into line with the idiosyncrasy of the OSS world [6]. Table 1

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summarizes the steps, identified adverse conditions and proposed adaptations for the VB technique [7].

The web artefact used to test the feasibility of the proposed technique was a blog. We selected a blog because it is a web artefact providing better control of the opinions expressed by users during our research (e.g., the researcher controls the information or sketches submitted by users for transmission to the developers) and because blogs are the web artefact most frequently used within the OSS community to facilitate open discussion [4].

Table 1. Steps, adverse conditions and proposed adaptations

Steps	Adverse conditions	Proposed adaptations
1. Users meet to apply the technique	User participation at face-to-face meetings is required.	Users participate posting their comments regarding the interface design in web artifacts.
2. Users submit their design tips (in the form of mock-ups)	Users are located at different geographical sites.	Users provide feedback and attach their designs in their blog comments
3. Users evaluate the designs	Users are not at the same geographical location.	The designs are published at regular intervals on the blog for evaluation by users.
4. An expert designs the final interface	A usability expert specializing in the technique is required	The expert is replaced by a HCI student supervised by a mentor.

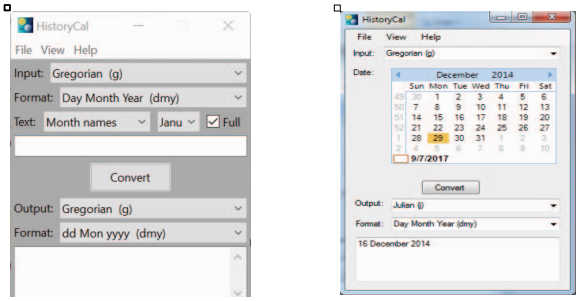
3 RESULTS

The developer of the HistoryCal project was not very familiar with usability issues in the software development process. While he was acquainted with the concept of usability, his knowledge of usability techniques was limited. We had difficulties recruiting real users to participate in technique application because the developer did not have a list of HistoryCal user emails. As we did not have access to this list of real users, we posted messages on the project forum, webpage and LinkedIn, inviting users to participate in the application of the VB technique. Finally, only five responses were received from all the users contacted (e.g., two users highlighted that they had trouble understanding how the application worked and that an example should be added, such as the input date in the selected format, another user suggested adding a calendar as an input data picker control. The VB technique was applied by creating two blogs on the WordPress platform: one in English[1] and the other in Spanish[2]. We built two versions of the blog because not all users are fluent in English and the developer, does not understand Spanish. When the users (all native Spanish speakers) submitted their design tips or comments by email to one of the authors of this paper, they were translated to English and published on both blogs. Then, the developer examined and responded to/commented on the tips or comments. All this feedback was published on the blog. Additionally, the developer responses/comments were translated and published on the Spanish blog.

[1] https://historycalhci.wordpress.com

[2] https://historycalhcies.wordpress.com

By applying the VB technique to the HistoryCal project, we were able to confirm that it is very hard to get a representative set of a users [5]. The fact that OSS developers are unacquainted with their user profile is a problem that has already been detected in other papers [2]. One contribution of our research is to provide empirical evidence that this really is the case. Although the VB technique only requires a few participants, we expected a higher participation rate. We believe that user participation in the application of the VB technique was low on the following grounds: Users do not have the time that it usually takes to design an interface, users are unfamiliar with graphic design issues, and there are no incentives to encourage participation in the application of the proposed technique. The UI developed as result of applying this technique is shown in Fig. 1 (b). This UI was created based on the inputs of users and the feedback received by the application developer.



(a) Original b) After Applying the VB technique

Figure 1. HistoryCal Interface

The HistoryCal community is currently active. Even though it is a small community, we still think that the findings are valuable for our research. We believe that the contributions of this research are even more valuable for projects of this type because they do not have enough resources to apply certain usability techniques, and developers do not have a list of representative users for technique application.

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