

A game to promote understanding about UCD methods and process

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Abstract. The User-centered design (UCD) game is a tool for human-computer interaction practitioners to demonstrate the key user-centered design methods and how they interrelate in the design process in an interactive and participatory manner. The target audiences are departments and institutions unfamiliar with UCD but whose work is related to the definition, creation, and update of a product or service.

Keywords: Games with a purpose, game pieces, HCI education, HCI evangelization, user-centered design, role-playing, design games, experience.

1 Introduction

Working in an environment that has a good understanding of user-centered design and its implications in a development process is crucial for the work of HCI and usability practitioners. Otherwise the results of their work might not be taken into account, used in an appropriate way or applied throughout the whole process. As a consequence, most often promoting this understanding becomes part of these practitioners' tasks.

The context of the present article is the Campus project, which aims to create a virtual campus in open source and under the license of General Public License (GPL). This project was initiated by nine universities of the Catalonia region in Spain and is promoted by the Catalan government. The Campus project will provide higher education both in a completely online fashion and combining online and offline learning for more than 300,000 students.

The key aspects of this project are unique to the field of e-learning. First, this Campus will support up to 10,000 users connected at the same time. Second, the product design will follow a user-centered design (UCD) approach. Third, the user interface will follow usability and accessibility principles and standards. These three pillars make the project challenging both from a human-computer interaction (HCI) perspective and from a technical stance, which is not the focus of this paper.

The project is organized in 12 work packages and besides the coordination and methodological packages, all except two are technically-oriented and led by programmers. These two exceptions are the first work package, which consists of gathering user requirements, and the second work package, which is responsible for the prototyping and user testing of all developed modules. Therefore, these two work packages with the help of the methodology package are responsible for ensuring that the entire project and, consequently, all development teams follow a UCD approach.

As Twidale and Marty state, usability professionals often have to combine the roles of usability advocates, educators and practitioners [10]. Bias and Mayhew [2] addressed this issue by putting together a collection of articles on cost-justification of usability. However, the argument of cost-justification by itself is not enough to introduce UCD in an organization. As Siegel [7] explains, “success will hinge not on a single convincing argument, but on the many interrelated ideas we introduce to our organizations, on the kinds of relationships we build with various stakeholders, and on how we demonstrate our value to them first hand.”

At the Open University of Catalonia (UOC), one of the Campus project participating universities, we created a game as a tool to increase the understanding of UCD methods. Through a participatory and interactive manner, its purpose is to promote a better understanding of a good design process; showing the importance of knowing the end user and keeping the focus on the user as well as choosing the right methods for analyzing the users and evaluating the design.

Several activities have been programmed in the context of the Campus project in order to proselytize and teach the project teams the importance of a UCD process and the best way to apply it. As a part of these activities, we decided to deploy the UCD game for the Campus project teams.

2 The UCD game: origin, audience and goals

The UCD game idea was created after the celebration of World Usability Day (WUD) 2005. As part of the UCD diffusion goal at UOC, different activities were organized for the occasion. There were formal presentations about in-house projects that followed the UCD process. Outside the conference room, a set of independent stations was placed for visitors to receive an overview of the UCD process and methods, experience a usability test in a lab setup, and use a computer with a screen reader installed (JAWS) in order to understand the importance of accessibility. This accessibility station, where participants had to browse the Internet with the monitor off and only with the help of the screen reader, was the most successful of all the activities organized.

The aim when designing the game was to obtain a set of engaging stations where participants can experience the different steps of a UCD process. It is structured as a team and participatory activity with a set of interrelated tasks because the goal is not only to show how each project phase is accomplished individually but also how the project is completed and how these different phases relate to one another.

2.1 The game goals

The setup of the UCD game is similar to the Interactionary, a design exercise envisioned and organized by Berkun [1], however, the main difference is that unlike Interactionary, our game is not an on-stage competition and does not address designers or an HCI audience. In this sense, the goals of the game show created by Twidale and Marty [10] are more closely related to our objectives. Yet, while their game illustrated usability evaluation methods, our game strives to illustrate the UCD process and techniques.

Buchenau and Fulton [3], in their paper about experience prototyping, quote the Chinese philosopher Lao Tse: “What I hear, I forget. What I see, I remember. What I do, I understand!” Our game is a way of promoting understanding by doing. Like Buchenau’s and Fulton’s, there are several papers on how to include “doing” in the design process by role-playing, informance design, interactive scenarios, participatory design, etc. [4,5,6,8,9]. However, these papers address a different problem than the UCD game and therefore are aimed to a different audience, pursuing different goals.

While addressing designing exploratory design games, Brandt [4] describes various kinds of games, one of which is similar in concept to the UCD game: “The primary aim with the negotiation and workflow oriented games is for the designers to understand existing work practice. Game boards and game pieces are produced in paper. The outcome of the game playing is often flow diagrams showing relations between people and various work task or tools.” In our case, we want the Campus project participants to understand UCD work practices using game pieces for each of the UCD phases and a game board to show the relations between the different phases and the end design.

In summary, the purpose of the game is: 1) To show the key steps of a UCD process in an enjoyable and informal setting. 2) To help participants understand how these steps relate to each other. 3) To provide an overview of the main HCI techniques and methods. 4) To illustrate that the user target and the methods used affect the end design.

2.2 The target audience

We initially created the UCD game in the context of the UOC, a completely online university with more than 40,000 students that offers 19 official undergraduate degrees as well as several graduate programs. As a result, the virtual campus plays a key role at the UOC as it is the work tool for UOC employees, the teaching tool for faculty members, and the learning tool for students.

In such a context, UCD should play a central role in all UOC departments that design products for the virtual campus users. Nevertheless, this is still not the case today. Although the introduction of usability and HCI concepts in the organization started in 2002, they are still not well understood and therefore not always properly applied.

Hence, we created the game as a tool to promote a better understanding of a good design process in hopes of demonstrating the importance of understanding and focusing on the end user as well as choosing the right methods for analyzing the users

and evaluating the design. The target audiences are organizational departments that participate in the creation, definition, and update of the virtual campus applications. Even though this target audience is formed by people familiar with the concept of usability and UCD, the goal is to ensure that the game is comprehensible even for people unaware of the existence of UCD.

Within the context of the Campus project, there are nine universities actively working in its development. Additionally, there are several other universities and public institutions that act as observers of the project and whom, in the near future, may use the virtual campus as their learning management system.

Therefore, the audience is much more diverse than at UOC since it includes active and passive management, project leaders and developers from both public and private institutions. For our purposes, the target audience of the game was management and project leaders since they are responsible for ensuring that their teams follow a UCD process. However, our aim was to include developers because the more participants that understand the value of UCD afford greater opportunities for UCD to be applied throughout the development processes.

3 The game structure

The game consists of four different stations; each station representing a phase in the UCD design process: defining the users, analyzing the users' needs, designing the artifact and evaluating the resulting artifacts. Like the exploratory design games [4], players do not compete. Each team goes through the stations and at the end, all game boards are shown together in a separate room so that participants and observers can evaluate the design solutions. The WUD promoted by the Usability Professionals' Association was the first background for the UCD game. The Campus project was the context of our second application of the game.

Groups of 3 to 4 people are created with participants from different institutions and departments. To begin, they read an overall description of the game and are given a one-page description of the design problem.

3.1 The design problem

Like Berkun [1], we decided that a non-web problem would work best with a large audience and that a physical design of a public and not-work related object would be better as these concepts are familiar to everyone, and the details are broad enough for everyone to follow along. Therefore, when considering a design problem, these issues played a key role; in the end, we opted for the design of an airport self-check in machine.

The initial design problem was to create a ticket vending machine. To narrow the scope, the machine was supposed to only sell tickets to the airport and it was to be placed in a central railroad station of Barcelona, Spain. For the self-check in machine, we also narrowed the project to the flights between Barcelona and Melbourne or Sydney of a specific airline company.

3.2 The first game station: Defining the users

The aim of this first station is to introduce the idea that good design is accomplished by thinking of the end user and that this end user is neither the designer, nor anyone else. The team is presented with four groups of people, each containing four users with pictures and a short demographic description. Participants are asked to choose the group of users for whom they will design and write down their main characteristics.

Initially, all possible users were presented individually but we realized that participants needed a substantial amount of time to choose and group a set of users in order to build their primary user type. We have found that having the groups already formed is clearer for our audiences.

3.3 The second game station: Analyzing the users' needs

The aim of this second station is to show that designers use several quantitative and qualitative methods to gather data about the chosen target. Defining the users is the first step, in this phase participants analyze the users' needs, wants, contexts, and limitations by choosing a maximum of three methods from the UCD toolbox.

After opening the envelopes of the selected methods, the team has to summarize the findings and write down a list of characteristics that should be considered when designing the artifact. For example, during the contextual inquiry method, the team watches a video of the Barcelona airport. For benchmarking, they have pictures of other self check-in machines already in use at the airport. Other methods available in the toolbox are: in-depth interview, focus groups, surveys and log analysis.

Outside of the envelope there is a short description of the technique to help participants choose the ones that they consider most useful. Inside there is more information about the technique being applied to the design problem and the results of conducting it. For instance, for an in-depth interview, the inside page contains a list of possible interview questions and a list of possible answers given by users.

3.4 The third game station: Designing the artifact

The goal of the third station is to show that a successful design is focused on the end user. As a consequence, designers should not jump directly to the end design but they should consider the output of the previous stations and follow an iterative design process. The team is also asked to use one of the evaluation methods available in another UCD toolbox. Assuming the team has understood the UCD philosophy, the result of this station will be a simple prototype and a list of changes that should be made to it after applying an evaluation technique.

The game organizers are the pretended users for the evaluation techniques. For user testing, the team has to think of one or two tasks they would like the user to accomplish. The organizer will then perform these tasks using the prototype.

3.5 The fourth game station: Evaluating the designed artifacts

At the end of the game, each team pastes the one-page output of each station on a horizontal game board. The board is separated into four quadrants: 1) photos of the target users and key characteristics, 2) required characteristics of the artifact according to the user analysis and the methods used, 3) the first low-fidelity prototype, a list of changes resulting from the evaluation of the prototype and 4) the evaluation of the development process.

Game boards are displayed in a room where participants and other observers can see the different designs and UCD processes. In order to evaluate the designs, participants and observers have a questionnaire that contains questions such as “Does the design take into account the context of use?” or “Did the team evaluate their first design solution?”

4 Deploying the UCD game

In order to test the game structure and its different stations, we initially ran a pilot of the game using a small group, half being HCI experts while the others were familiar with UCD but had never applied a full UCD process. The mixed groups were required to traverse through each of the four stations of the game: defining the target user, analyzing its needs, designing, and evaluating. It was very rewarding to see the groups make different decisions at each of the stations. Since the groups defined different user characteristics and target goals as well as selected different evaluation methods, the final designs varied greatly. In this sense, the pilot study proved that the game is useful in showing how phases relate to each other and that designs depend on characteristics of the end user and the methods used. Through the post-game questionnaire, we concluded that all participants considered the game useful to show the value of UCD methods and process and that it was an enjoyable, refreshing and enriching experience. We also obtained feedback on areas to improve, such as a tighter control of time for each station and a less technical and ambiguous description of the phases and methods.

Our second application of the game was on November 14th during World Usability Day 2006. Around thirty people (8 groups) participated in the game. From observing the teams and the post-game questionnaire, we gathered that most participants enjoyed the experience and found it a successful tool to show UCD process and methods. Again the time spent on each station was perceived as too long despite the timers at each station and the organizers, who tried to encourage groups to move to the next station. Participants that had an interest in UCD wanted to do a good work on each phase and therefore they took longer than the allowed time. The biggest problem caused by lack of time was that the teams were not able to view the other teams' solutions. Thus, visualizing how different target users and processes led to different results was one of the goals not accomplished in this application of the game.

Running the UCD game for the Campus project participants was more challenging since most people are not interested in UCD. This lack of interest reduced the

problem of the time issue but still made the game useful as another tool to promote understanding about the UCD process and approach.

5 Conclusions

We created the game in order to show the UCD process and methods to an audience of non-experts but whose tasks are related to the definition, creation, and update of a product or service. We have deployed the game in three different occasions with diverse contexts and audiences. The feedback given by the different types of participants told us that the game is perceived as enjoyable and useful for our purpose.

Recalling our goals when creating the game (1) To show the key steps of a UCD process in an enjoyable and informal setting. 2) To help participants understand how these steps relate to each other. 3) To provide an overview of the main HCI techniques and methods. 4) To illustrate that the user target and the methods used affect the end design.), we are confident that it manages to accomplish the four objectives in a short period of time. However, a new question arises: does it make a difference in the participants' everyday work? Will they consider applying a UCD approach in their next project? Will they be more willing to include the results of UCD methods in their work?

We plan to answer these questions by deploying again the UCD game in the Campus project context but with the real design problem. As it has been mentioned, the first work package of the project is to gather user requirements. The output of the package will be personas, scenarios and needs of the future campus users. We will use the project main goal as the design problem and these outputs to prepare the game materials. With this new focus of the game, we expect to increase the developers' involvement in the UCD process as well as interesting feedback from both developers and observers for the project development.

The UCD game is a powerful and flexible tool that can be applied for different goals, in diverse contexts and for different audiences. Although each setting will require an adapted design problem, the overall structure of the game is a useful guide for all cases.

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