The Role of Input Devices in the Gaming Experience

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ABSTRACT

This paper reports on my doctoral work done at UCLIC that looks at how novel input devices affect the gaming experience. The paper presents the motivation, question, methodology, expected contributions, partial results and time line to complete the thesis.

Categories and Subject Descriptors

H.1.2 User/Machine Systems

General Terms

Human Factors

Keywords

User Experience, Videogames, Input Devices.

1.MOTIVATION

During the last decade, Human Computer Interaction (HCI) has had an influx of new input devices that aim at providing a more real interaction between users and computers. Examples of these real interaction applications are Tangible User Interfaces, Ubiquitous Computing, Lightweight interfaces, and so on [4].

Although the nature of what makes an input device more real or surreal can be questioned, the projects that developed these new devices claim that the new devices provide a better interaction and are in general more usable. Without questioning the methodology used, it is not clear if the users of these new devices like them because of the novelty of the device or because they provide a better experience. The methodology of these projects is not questioned because it relies on an overall goal of providing a more usable application, if the user can perform a task more efficiently and effectively then the application is good. The aim in providing *reality based* interaction styles should be driven by the objective of providing the user with a better experience, not just a more usable system. Although there is a strong relationship between usability and user experience, as a poorly usable interfaces can indeed mar the experience of the user, an application made to the highest

usability standards does not necessarily imply a good user experience.

For the interaction styles the difference between usability and experience becomes wider when users after experiencing the new styles decide to go back to their legacy systems. What is the point, then, in creating Tangible User Interfaces if the user would just put away and go back to the mouse and keyboard to perform the exact same task? Narrowing the scope of interaction styles to only the input devices, this thesis aims at understanding how input devices affect the user experience. User experience is defined, for this work, as a function of the elements that affect the task. User narratives are the main source of experience. The nature of user experience is discussed below. Videogames provide an approachable application domain since their main objective of any videogame is to provide its users with a positive user experience. The user experience while playing videogames is then referred to as the gaming experience.

2.THE QUESTION

The question that is driving this research is: *What is the role of input devices in the gaming experience?*

Finding the answer to this question requires work in three different research domains: Input Devices, User Experience and Videogames. Regarding input devices, this work, rather than aiming at building or modeling new input devices, looks at the previous work for existing novel input devices, the testing methodologies used, and the motivation behind their design. The role that the input devices have on the experience of users is studied in the emerging area of user experience. Standard HCI books [7] define user experience as the subjective feeling of the user while interacting with an application. It is usually associated with aesthetics or flow. Until recently, User Experience was just a black box of something that surrounded usability [3]. However, there is a trend of new research (e.g. [1, 2, 5, 6, and 9]) that tries to identify what the user experience is, mechanisms to assess it, and how to design for it. This research uses the existing contributions in User Experience in order to answer the question, and will investigate mechanisms to assess and design for experience.

Finally, videogames were chosen as the application domain because their nature is to provide users with a positive user experience. Also, videogames use different input device, such as different types of pads, mouse and keyboard, steering wheels, etc. therefore, videogames made a natural match to find the answer to the above question. It is important to notice that this research does not aim at developing new games, or methods to evaluate videogames. It looks at the experience of videogames, and how input devices affect it.

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Regarding the methodology, the nature of the question leads to an empirical/design approach to answer it. The approach taken looks at defining the gaming experience, understand methods to assess experience, and finally design and evaluate for experience. The methodology is discussed in more detail below. One path not followed in this research was to do a comparison between input devices and ask users to rate them. This was due to two factors, one trivial and one of depth. The trivial one is that we don't have access to the input devices developed at other schools. It is because of the second factor, which although an effort could have been made to collect them, there is not enough evidence that the design of the new input device was in order to create a better user experience.

3.EXPECTED CONTRIBUTIONS

The major contributions are expected in the area of User Experience. The expected results would enrich the literature of user experience and the way it is understood. It would also provide a methodology to design for and evaluate user experience and input devices. Another contribution would be a working prototype of a videogame that uses novel input device and standard ones.

4.METHODOLOGY

The research question poses an easy to describe inquiry, "What is"; finding its answer, in the other hand, is not easy to describe and an empirical approach using a mixed methodology was followed. The methodology used benefits from cases studies, ethnographies, experience narratives, experiments and design. The approach followed began by defining the concept of "gaming experience", a somehow common term but in the best of cases its definition was taken for granted or it was just ill defined. The methodology used was Grounded Theory [8]. The data used was commercial over the counter magazines and websites that reviewed videogames. The underlying questions were "How are videogames described?" and "Which elements of the videogame affect the experience?" After the theory was constructed, a series of interviews with game designers, players and reviewers were conducted to validate the results.

Once gaming experience was defined, the next step was to understand how it could be evaluated. Although there is a wide literature on experience and user experience with technology, there is not a clear or established method to conduct experiments and assess the experience. The path taken in this research was to invite participants to play or interact with videogames in different ways, and then ask about their experiences. With the obtained results a preliminary framework was developed with the idea of helping in the final evaluation. The following step is to observe how participants interact with games that use other means of interaction, such as board games and videogames. An ethnographic study is planned which involves first observing how players interact with the game, and then modifying the way of interacting. The lessons learned from the study will inform the design of a videogame that uses new input devices. Only the interaction style of the game will be designed, and a standard off the shelf videogame is going to be used as a platform. The final step will be to evaluate the new system and compare it with a system that only uses mouse and keyboard.

5.SETBACKS

The key setback found so far is the multidisciplinary of HCI. The literature on User Experience is heavily based in

philosophy, and the empirical methods are imported from psychology. Neither of those two areas are part of my forming background. And although there is great support from my Supervisors, it is not easy to discern when it is necessary to understand everything completely or just the key points.

The other problem is the overload of information. Papers keep coming in from Google scholar, user experience and input devices are topics that are still being heavily researched, hence the constant flow of new papers, sometimes without proper references. Just as the previous problem, the solution relies on being able to stop reading and concentrate in the developmental part of the project, but every new paper seems crucial to my research.

6.RESULTS AND TIMELINE

Most of the literature review has been finished. The elements of the gaming experience have been identified, and a preliminary framework to understand and evaluate experience has been formulated. The next steps are to start the ethnographic studies on board game players and videogame players. Design the input devices for the videogame and formulate the evaluation study. The ethnographic studies are due to be finish by August 2007, the design process by December 2007, and the evaluation study by April 2008. The thesis should be submitted by June 2008.

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