Exploring the Role of Emotion in the Interaction Design of Digital Music Players

John Zimmerman
Human-Computer Interaction Institute, Carnegie Mellon University
5000 Forbes Avenue, Pittsburgh, PA 15213, +1.412.268.1313
johnz@cs.cmu.edu

ABSTRACT

This paper documents students' interaction designs for digital music players that consider both the emotional quality of interaction as well as usability.

Categories and Subject Descriptors

H.5.2 [**Information Interfaces and Presentation**]: User Interfaces – *interaction styles, theory and method, user-centered design.*

H.5.m [**Miscellaneous**]:

General Terms Design.

Keywords

Interaction design, affective design, music interface.

1. INTRODUCTION

Hartmut Esslinger, founder of the design firm Frog, employs the design philosophy, "Form follows emotion." [6] For the interaction designer, the question then follows, "Does interaction follow emotion?" Traditionally, most interaction design has focused on ease of use: interfaces that are obvious, useful, and efficient. Some research has been done on affect and interaction, but the majority of this work has focused on capturing the user's affect as input into a computer system [3] [4]. For example, if the computer makes a user mad and they hit it, this information can be captured so the system can learn from this interaction. With the growing interest in the role of emotion in product design, interaction designers need to refocus, and explore more of the relationship between interaction, emotion, usability, and industrial design.

2. EXPLORATION

In order to better understand this relationship, undergraduate design students, working in teams of three, were tasked with designing new methods of interacting with digital music players that consider both the emotional connection between the user and music player as well as usability. I chose music as a starting place for this research because of the obvious emotional connection between people and music. In order to balance the relationship of emotion and usability, students were given specific target groups and user contexts.

Students had backgrounds in either communication design or industrial design. However, they had little exposure to current methods or technologies of interaction design. Their knowledge of music selection consisted of downloading music from the web, the Apple I-pod, and the industrial designs of Bang and Olufsen. As a primer for this exploration, I had them examine the following:

1. musicalBottles [2]. Device plays music when user inserts a stopper into a bottle.
2. The Marble Answering Machine [5]. Messages appear as marbles that users set on the speaker for playback.
3. The Whisper Phone [1]. System uses connected ring and bracelet as a telephone. Ring uses bone induction to turn fingernail into a speaker.

Students began to design by talking to target users and physically exploring the different contexts. Next they generated mood boards to capture the emotional requirements for interaction. Finally, they iterated several concepts and produced a final interaction design.

3. SAMPLE DESIGNS

3.1 MusicWear

Students designed the MusicWear mobile audio player for female athletes between the ages of 14 and 32 to use while running. Users interact with the system by stroking a soft pad worn on their belly. In discussions with target users, students learned that music pumps users up, improves mood, distracts from physical activity and pain, and even helps runners to relax. Usability issues included: the need to quickly pause music due to distractions, bulk/physical discomfort, lack of fine motor control during running (especially when cold), and difficulty in skipping songs.
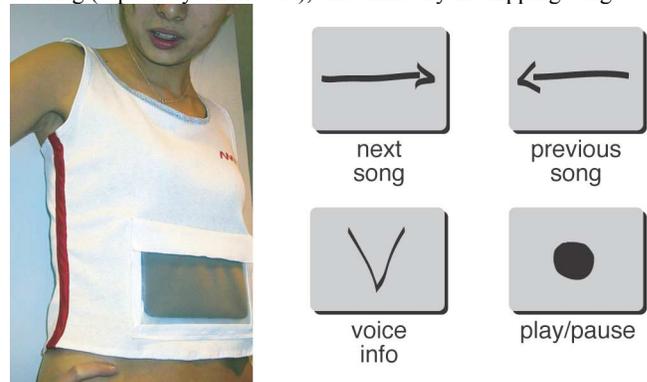

Figure 1. MusicWear device and sample gestures.

Interaction with the device is both very private and intimate. Users tap their bellies with their hand to toggle the device between play and pause. Stroking left or right changes the song. Making a "V" gesture plays a verbal description of the song (title, artist, etc.) over the music. In addition, users can define their own gestures and apply them to playlists. Users' taps and strokes reinforce the inward focus and physical nature of training. The interaction, like the activity, focuses on the user's body. At the same time, usability has not been compromised. The simple tap action allows users to effortlessly deal with distractions that require music-free attention. In addition, the gross movement of the strokes is much easier on the hands (even gloved hands) than current buttons and knobs.

3.2 Sphere

Designed for the living rooms of young moderns, The Sphere music player employs a simple yet non-obvious interface to instill envy in guests. Users select a playlist by placing a small colored sphere from the base of the device into a hole on the top. Pushing down on the device toggles it between the "up" play mode and the "down" pause mode. Users twist the device left or right to skip or repeat a song, and users stroke the device left or right to increase or decrease the volume.

Figure 2. Sphere music player with transparent speakers.

After speaking to target users, students decided that invoking envy in others was the most important emotional requirement of young-moderns. The non-obvious interaction allows the user to feel in control. At the same time, the simplicity of the interaction makes it almost impossible to forget how to operate. Transparent, flat speakers further the design. They can display pulsating patterns when guests visit, or the displays can be turned off, making the speakers disappear into the background.

3.3 Spinner

Designed as a portable player for teenage males, Spinner focuses on the social aspects of sharing music. Users can make custom playlists and mixes and store the metadata describing these on acrylic rods. Jamming the rod into the side of the device loads the playlist encoded on the rod. The jamming action, similar to inserting a battery into a driver drill or shoving a clip into a semi-automatic handgun, provides a feeling of power and control. In addition to being a simple action to perform, the interaction is intended to generate an "In your face!" emotional feeling that is quite attractive to teenage males.

Figure 3. Spinner music player with playlist rod.

4. CONCLUSION

Having students focus on both the emotional connection and the usability of the device allowed them to quickly move past the knob and button controls traditionally found on music players. This design approach allowed students to more easily see the relationship between emotion, industrial design, and interaction design.

4.1 Future Work

In the future, I plan on having more students produce emotion/usability-focused interfaces for digital music players. In addition, I plan on both running user evaluations of selected interaction designs and expanding the scope to other devices that share a strong emotional connection with users.

5. ACKNOWLEDGMENTS

6. REFERENCES

[1] Fukumoto, M., Tonomura, Y. Whisper: A Wristwatch Style Wearable Handset, in Proceedings of CHI '99 (Pittsburgh PA, 1999), ACM Press, 112-118.

[2] Ishii, H., Mazalek, A., Lee, J. Bottles as a Minimal Interface to Access Digital Information, in Proceedings of CHI '01 (Seattle, WA, 2001), ACM Press, 187-188.

[3] Picard, R. Affective Computing. MIT Press, Cambridge MA, 2000.

[4] Reeves, B., Nass, C. The Media Equation: How People Treat Computers, Television, and New Media Like Real People and Places. Cambridge University Press, Cambridge, UK, 1996.

[5] Svanaes, D., Verplank, W. In Search of Metaphors for Tangible User Interfaces, in Proceedings of DARE '00 (Elsinore Denmark, 2000), ACM Press, 121-129.

[6] Sweet, F. Frog: Form Follows Emotion. Watson-Guptill, New York NY, 1999.