

Interaction Relabelling and Extreme Characters: Methods for Exploring Aesthetic Interactions

J.P. Djajadiningrat

Delft University of Technology

ID-StudioLab

Jaffalaan 9

Delft, NL-2628 BX

+31 15 2783775

J.P.Djajadiningrat@io.tudelft.nl

W.W. Gaver

Royal College of Art

Computer Related Design

Kensington Gore

London, SW7 2EU, UK

+44 20 7590 4296

W.Gaver@rca.ac.uk

J.W. Frens

c/o Delft University of Technology

ID-StudioLab

Jaffalaan 9

Delft, NL-2628 BX

+31 15 2783775

jwf@earthling.net

ABSTRACT

Aesthetics and interaction are interwoven concepts, rather than separate entities. An aesthetics of interaction must consider richness in appearance, actions, and role. Moving beyond a narrow focus on usability in this way requires new methods for understanding design possibilities. Here we describe two: interaction relabelling, in which possible interactions with a known mechanical device are mapped to the functions of an electronic device to be designed; and extreme characters, in which fictional users with exaggerated emotional attitudes are taken as the basis of design to highlight cultural issues. These methods may help designers in considering physical interactions with products on the one hand, and the sociocultural role their products will take on the other.

Keywords

product design, design techniques, aesthetics, interaction, roles.

1. INTRODUCTION

In this paper we describe two techniques to explore interactions guided by aesthetics rather than ease of use. The first, interaction relabelling, helps designers explore richness of actions. The second, designing for extreme characters, helps them to explore sociocultural aspects of their designs. We illustrate these two techniques by means of the design for an appointment manager, the Masters project of Frens [3]. The appointment manager is a hand-held electronic device which assists its owner in managing his appointments. A starting assumption of the project was that to successfully aid its user, the appointment manager needs to have some idea of the user's overall preferences as well as the user's feelings about each appointment.

Aesthetics and interaction are often treated as separate concepts in product design, a situation to which we strongly object. When they are separated, aesthetics are usually applied to making products desirable in appearance, while interaction design is preoccupied with usability, and particularly 'ease of use'. While usability is often

Permission to make digital or hard copies of all or part of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. To copy otherwise, or republish, to post on servers or to redistribute to lists, requires prior specific permission and/or a fee.

DIS '00, Brooklyn, New York.

Copyright 2000 ACM 1-58113-219-0/00/0008...\$5.00.

a laudable goal, it isn't enough. Focusing on ease of use tends to encourage a narrow view of what 'use' is with respect to technology, emphasising efficiency and productivity over exploration or curiosity. With a correspondingly narrow range of models for usability, interaction tends to be self-similar, mundane, and ultimately boring.

We believe that aesthetics and interaction are tightly interwoven, so that the aesthetics of a product must be shaped according to its functions and roles, and its interactions must be judged by their aesthetic qualities—both sensory and conceptual. This leads to an aesthetics of interaction, in which the emphasis shifts from an aesthetically controlled appearance to an aesthetically controlled interaction, of which appearance is a part. Aesthetics of interaction moves the focus from ease of use to enjoyment of the experience [4].

A requirement for an aesthetics of interaction is attention to the richness of a system's appearance, interaction, and potential roles. By richness in appearance we mean that the product and its controls distinguish themselves through differentiation in form, material and texture. Richness in appearance can attract users to act through the expectation of a beautiful—or aesthetically powerful—interaction. By richness in interaction, we mean that the engagement between user and system should have an interesting and variable flow. Different functions should be operated through different actions, and the timing of system responses should be appropriate to the actions and functions involved. By richness in role, we mean that the systems appearance, interactions, and functions must reflect the potential sociocultural complexity of those using them [2]. Devices play a role in their users' lives, and imply the role of their users: through its appearance, interaction, and functionality, each product tells a story about its user and the relationship between them.

Users find enjoyment from a product's combination of appearance, interaction and roles. Current black boxes, designed for generic users and with rows and rows of similar looking controls which all require pushing, turning, or sliding lack richness in all three dimensions. In order to add appropriate complexity, methods are needed to explore different interaction possibilities and the potential complexities of users.

2. INTERACTION RELABELLING

As a technique for opening ideas about rich forms of interaction with electronic products, we have experimented with interaction relabelling. In this method, participants are asked to consider an existing product, and, pretending that it is the product to be

designed, to tell and act out how it works. The two products need not be related; in fact, unrelated products may lead to more creative ideas. Using unrelated products helps designers to part with the interaction style that is prototypical for the product they are designing. By forcing a mapping between things with quite different functionalities, the focus shifts from the functionality to the actual interaction possibilities. Interaction relabelling also helps in exploring roles. Different styles of interaction suggest different things about users and how they value the product.

On a practical level, we have found that mechanical products with many moving parts work particularly well, since they allow people to try out actions which are not normally associated with electronic products. A revolver, for example, has many moving parts (Figure 1). It can be opened, it has cylinder which can rotate and which accepts bullets, it has a trigger and a hammer. Actions involving these parts can all be mapped to the functionality of the object to be designed.

Interaction relabelling works better as group exercise than as an individual exercise. The competitive element in a group, helps the participants to overcome their inhibitions in what at first appears to be a silly exercise. We feel that the actual handling of the object and trying out actions, rather than just thinking them through, is essential to this technique.



Figure 1. The toy revolver

When Frens relabelled a toy revolver for his appointment manager project, several ideas for how people might interact with appointments were highlighted (Figure 2). Appointments were almost always mapped to bullets, leading to several physical interactions that might be appropriate to them. These included loading blanks to plan moments of rest, firing the gun at someone to make an appointment with that person, rotating the cylinder to scroll through appointments, and even emptying the bullets from the gun to cancel all appointments. The revolver, meanwhile, became a display device for the bullet-events. The participants' ideas included putting the gun to your ear to listen to appointments, the gun firing itself to signal an upcoming appointment with the loudness expressing its importance, and pointing at a wall and repeatedly firing the gun to project information about each appointment. Note

that the metaphor need not be consistent. It is the resulting richness of gestures, not the metaphor that is important. In fact, designs resulting from relabelling the toygun need not be visually related to a firearm at all.



Figure 2. Interaction relabelling with the toy revolver

The 'hands-on' nature of interaction relabelling enables participants to come up with novel ideas about interaction which are different from those which emerge from market research, literature studies, traditional brainstorming techniques or sketching. A different choice of object highlights different interaction possibilities. Relabelling a simple object, such as a stapler, forces designers to think in equally simple actions for the product to be designed, while choosing a complex object, such as a Swiss Army knife, allows them to think of a more gadget-like product. Through the connotations of the object that is relabelled, the technique also makes designers aware of the socio-cultural role their products can play. A PDA which draws upon interaction with a simple stapler suggests its owner has a very different attitude towards appointments than one whose actions resemble a precise and complex Swiss Army knife.

3. DESIGN FOR EXTREME CHARACTERS

Products are often designed for a particular target group. A well-known approach is to write a scenario for a prototypical character from this target group. For example, when designing a PDA, we may write a scenario around Jack, who is a management consultant. The scenario may be very detailed in terms of lifestyle. Jack likes wearing Hugo Boss suits and driving his BMW. However, from an emotional point of view Jack seems shallow and completely out of touch with the real world—apart from work. Jack is always keen to go to his next appointment, he is never tired, never bored. He does not seem to have any bad character traits either: he is nice and serious. This is reflected in the roles the product supports. The appearance of and the interaction with the resulting PDA tell the story of Jack and his relationship with the product. While the user does not know about the scenario, he is still confronted with Jack's values since the product's role supports Jack. Designing for prototypical characters such as Jack ignores the full spectrum of human emotions, it only addresses those recognized as socially or culturally desirable.

Designing for extreme characters is a technique which tries to steer away from the usual designing for a prototypical character from a target group. In fact, it takes the opposite approach. Instead of

designing for characters that are emotionally shallow, we design for characters that have exaggerated emotional attitudes. By taking characters that are extremes, character traits can be exposed which, though common, remain hidden because they are antisocial or in conflict with a person's status.

In his project, Frens designed for three extreme characters: a drugsdealer, the Pope and a polyandrous twenty-year old. The characters were not only described in words, but also visualized in the form of collages showing a day in their lives. Through role-playing with fellow students, the three characters came further alive [1]. This development of the character through visuals and role playing is important as it draws links between the character and appearance, actions and role, which are difficult to anticipate or express using words alone. Each of the three characters has a unique attitude towards appointments. We will describe the characters, then the concepts which resulted, and discuss in which way the insights are valuable for mainstream PDAs.

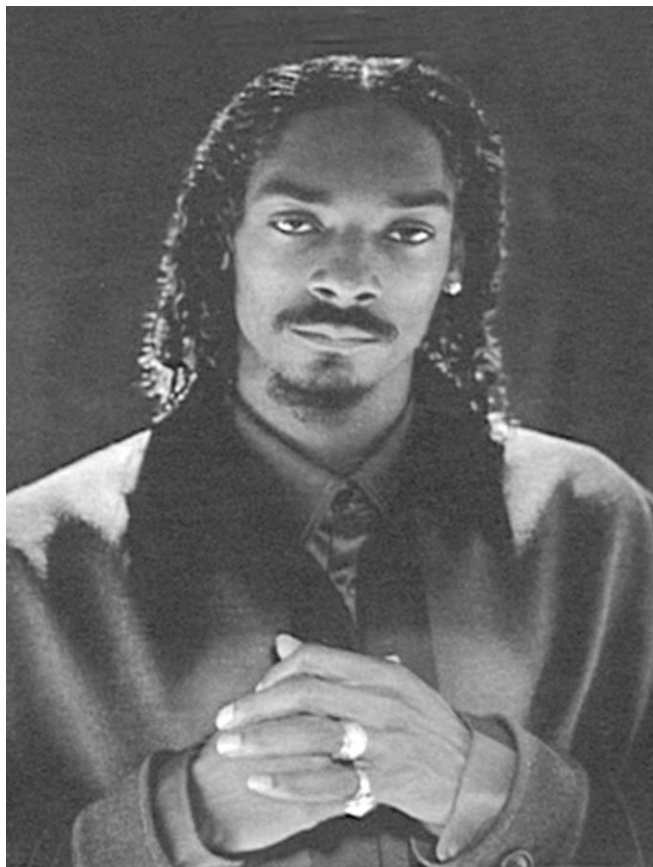


Figure 3. The drugsdealer

3.1 The drugsdealer

Profile—The drugsdealer is a powerful person who manages rather than commits crimes (Figure 3). To cover up his illegal dealings, he is also involved in legal activities. The drugsdealer is highly aware of his place in the drugs trade hierarchy. Above him in rank are the big players from whom he buys, below him are the drugs runners to whom he sells. It is a rough world, and in response the drugsdealer has adopted an opportunistic attitude in his pursuit of money and power.

Attitude towards appointments.—The drugsdealer has two agendas, one legal and one illegal. The information about his illegal activities is very sensitive. It should not fall into the wrong hands, be it 'colleagues' or the police. Clearly, he is very careful with whom he makes appointments and where. Meeting places are specified by their characteristics. Roads which will allow a quick get-away and buildings which will provide cover are important considerations. The drugsdealer does not plan very far ahead. Dealers come and go; the scene may look very different next week. The drugsdealer is ambivalent about exposing his appointments. On the one hand, they contain sensitive information. On the other, exposing them means enforcing his position in the hierarchy, a kind of powerplay which draws new trade. In his appointments he needs to express his respect for the big players and his superiority over the smaller dealers to whom he sells.

3.2 The Pope

Profile—The Pope is a person who is very powerful in theory, though in many ways his actions and emotions are prescribed (Figure 4). He is very much restricted by protocol. Frens' fictitious Pope saw his formal appointments as tedious and valued his leisure time very highly. He enjoyed a stroll in the Vatican gardens and the conversations with his favourite nun. When it came to his formal tasks, the Pope needed a little encouragement from time to time. The Pope knew that he could get in trouble if he did not fulfil his formal duties. In a sense, he viewed his negotiations with the appointment manager to gain leisure time as a kind of game.



Figure 4. The fictitious Pope

Attitude towards appointments.—The Pope's life is full of compulsory, repeating appointments. In the time slots that remain, the Pope likes to enter as many personal appointments as possible, so that he cannot be hassled for other tasks. While he needs to share the information in his agenda with others who organize his public life, there are some appointments which he would rather not disclose to others.

3.3 Hedonistic, polyandrous twenty-year old

Profile—This is a fun-loving woman who has a great many social contacts, including several boyfriends (Figure 5). She has got a normal day job as a school teacher. But what she looks forward to all day is her free time after work and during the weekends. Full of

energy, she is always looking to have a good time. Going out can be nerve-wrecking though, as she needs to be careful about boyfriends meeting each other. She needs people around her, as she is not very good at amusing herself on her own.

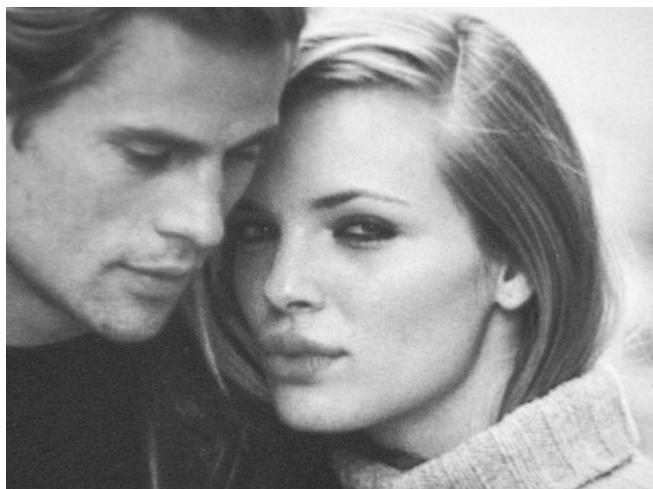


Figure 5. The hedonistic, polyandrous twenty-year old

Attitude towards appointments—For the twenty-year old, part of the fun is juggling appointments in such a way that her boyfriends do not learn of each others' existence. When asked out by more than one boyfriend, she wonders what she feels like doing that evening and which boyfriend fits that idea best.

4. CONCEPTS

4.1 The drugsdealer's rings

The appointment manager for the drugsdealer consists of a set of rings and a pouch in which the rings can be stored when not in use (Figure 6). Each ring that the drugsdealer wears stands for an appointment (Figure 7). Since the drugsdealer plans only one day ahead, the number of rings which fits on both hands is sufficient for one day. Which finger a ring is on determines the importance of the appointment: the more towards the little finger, the more trivial. The rings are available in different forms and materials so that when the drugsdealer makes an appointment with a person, he can choose a ring matching that person's place in the trade hierarchy. Rings can consist of two parts so that when a task is delegated, one part is given away, with completion being signalled by the parts being reunited. A sleeve-like ring which prevents a finger from bending can function as a physical reminder of an urgent appointment. Embedded electronics make each ring aware of its value and the appointment's time and place. Finally, abstract patterns of light emitted by a ring can signal conflicting appointments as the drugsdealer tries to fit an appointment into his schedule.

The design of the drugsdealer's rings reflects his ambivalent attitude towards exposing his appointments. On the one hand, he shows off how busy he is, enforcing his position. On the other, he does not want to disclose any details about his appointments. The rings form a kind of augmented 'knot-in-a-handkerchief' appointment manager.

4.2 The Pope's stubborn pen

The Pope uses a digital version of pen, inkwells and paper (Figure 8). Seemingly conventional, these objects blend in with the rest of



Figure 6. Premodels for the rings for the drugsdealer



Figure 7. The rings for the drugsdealer

the Vatican's interior. Differently shaped inkwells represent various emotions (Figure 9). Dipping the pen in an inkwell causes it to be charged with a certain emotion. The pen recognizes the Pope's handwriting and tracks how much of each digital ink is used. When the ratio of leisure time to imposed appointments drops too low, the digital pen simply stops writing with leisure-related inks. To be able to collect more leisure time, the Pope has no choice but to complete more formal appointments.

The design of the stubborn pen reflects a tension between autonomy and responsibility for the Pope. On the one hand, the stubborn pen comes across as a dictator, reifying his own good intentions as well as outside requests and insisting that he respect these demands. On the other hand, a strong hand in his life is exactly what the Pope needs; it helps the Pope stay out of trouble. Taking the implicit conflict to humorous levels through the stubborn pen, Frens highlighted an issue that seems true for all appointments managers.



Figure 8. The stubborn pen with various inkwells

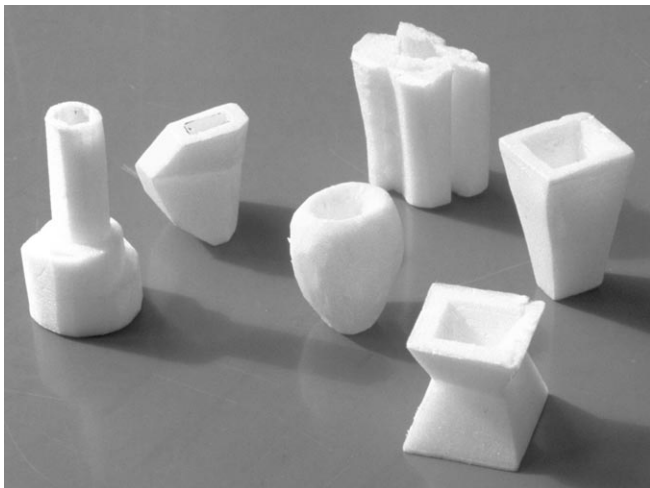


Figure 9. Premodels for the inkwells

4.3 The twenty-year old's appointment fan

The appointment manager of the polyandrous woman makes use of five circular screens which fold up in a fan-like manner. To support the woman in her polyandrous behaviour, the fan is usable in two modes. In the first mode, which is called public mode, all the screens are folded in and only the top screen is visible. This is the mode which she can use without worries while amongst other people. If necessary she can take a quick peek at one of the other screens. In the second mode, called private mode, the screens are folded out. In this mode the woman can check upon sensitive information. Through the playful positioning of the screens, the woman can rate and compare her boyfriends on a fun-profile with issues such as dining, shopping, partying, sex etc.

The appointment fan fits the twenty-year old's attitudes. It helps her maintain her hedonistic lifestyle by remembering attributes of boyfriends and allowing her to adjust these through an uncomplicated, playful interface. The dual modes allow her to use

the device in public without disclosing the details of her agenda, satisfying her special need for privacy.

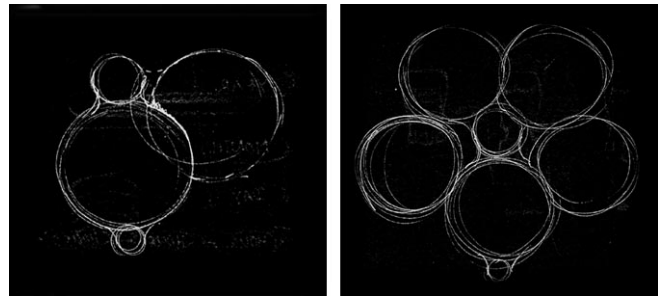


Figure 10. A quick peek at a screen in public mode (left) and all screens folded out in private mode (right).



Figure 11. Premodels of the appointment fan

5. EVALUATING THE CONCEPTS

The rings for the drugsdealer opened interesting possibilities for actions, such as linking importance to placement and delegating through sharing. However, the aesthetics of the rings for the drugsdealer are rather stereotypical. The design is directly based on our notion of drugsdealers wearing jewellery as they are portrayed in films. Similarly, the role the rings support is that of a stereotypical drugsdealer. This stereotypicality of both aesthetics and role makes it difficult to apply the concept to the real world without the drugsdealer shining through.

The Pope turned out to be a difficult character as his remoteness from the world made him difficult to identify with. As it did not seem appropriate to equip the Pope with a high-tech gadget-like appointment manager, the concept stayed rather close to the pen-paper metaphor. As a result, the concept offers few new insights in terms of appearance and actions. An interesting aspect of the Pope's appointment manager is that it forces its owner to balance the types of appointments. While at first this design may come across as a 'dictator', it can also be interpreted as helpful for those who tend to leave their professional tasks till the last moment.

Frens chose to develop the concept for the twenty-year old's appointment fan further. Designs for the twenty-year old were the least stereotypical, both in appearance and in interaction. Frens translated the frivolity of the character into playfulness in interaction. The multiple blades invite ranking of boyfriends and the interface is completely pictorially oriented, using pictures taken

with an integrated camera to describe the person, location and subject of an appointment. While the twenty-year old may come across as a frivolous character, some ideas for the appointment fan can easily be introduced to more serious applications. For example, by replacing 'boyfriends' with 'business contacts', moving the blades could become a way of judging business priorities. Likewise, for a freelancer, public mode may become a way of shielding ties with one client while visiting another.



Figure 12. The final model folded in (public mode)



Figure 13. The final model folded out (private mode)

6. CONCLUSIONS

Interaction relabelling helps designers break loose from existing notions of interaction. For PDAs, whose interactions have got stuck in graphical user interfaces scaled-down from desktop monitor size, the fresh look provided by interaction relabelling turned out to be quite useful. The technique exposes how poor most electronic products are in terms of actions when compared to mechanical products. Apart from widening the designer's view on possible actions, the technique also helps to explore how the actions influence the role a product supports. An appointment manager offers a very different view of its owner and their relationship when it is a gun than a traditional PDA; the kind of emotional relationship the user has with appointments is different. Although interaction

relabelling is not directly concerned with appearance, any changes in actions will force a rethink of the product's aesthetics.

Designing for extreme characters was useful for this project in highlighting issues such as secrecy, status, and autonomy not normally emphasized by appointment managers. While they were discussed as separate concepts, for Frens they also had synergistic strength, with aspects of one extreme character influencing the other. We hope to have illustrated that designing for the polyandrous woman allowed Frens to break away from existing notions of PDA aesthetics and PDA interaction. In fact, the appointment fan is more likely to fit the twenty-year old in terms of aesthetics, functionality, and cultural signification than the PDA. This is the central aspect of designing for extreme characters: the extremes make one realize that the way things are is not necessarily the only way. They allow one to think of the richness of aesthetics, interactions and roles that electronic products could offer next to the narrow, existing ones.

During the project we have become aware of the importance of the choice of character. Two of the three extreme characters that we used were stereotypical, and to at least one reviewer offensively so. The jewellery wearing drugsdealer and the attractive polyandrous woman touch upon sensitive issues such as race and gender, and the clichéd images used to portray them exacerbate this problem. Moreover, using the Pope as a third character runs the risk of causing offence to others (even without our mentioning his fictional girlfriend). We recognise the problems of publishing such descriptions here, and apologise for any offence caused by doing so. It should be remembered, however, that these characters were chosen as part of an in-house design process, as a way of uncovering more generally applicable issues, and we are publishing them here to illustrate the process without suggesting that they in any way represent real users or that they would be carried through in the development of designs. Instead, their power was in allowing the designer to draw inspiration from the film, publishing and fashion industries, which also work with these stereotypes. In future projects, we plan to explore extreme characters that are not so clichéd, such as a professor who does drugs or an introvert drugsdealer. While such characters may be more difficult to design for as they are seldom represented in mainstream media, they may well lead to more complex and interesting ideas.

The two techniques described in this article aid designers in achieving richness on the actions and role levels. Interaction relabelling tries to open up the spectrum of actions that can be used. It makes us aware of the richness of actions present in mechanical artifacts, which is absent in the controls of electronic products. It also helps to explore how the interaction influences the relationship between user and product. Designing for extreme characters tries to expose those emotions and character traits which remain hidden in scenarios for supposedly real-life characters because they are incorrect or embarrassing. The technique reminds us that in order to design humane products, these 'undesirable' emotions and character traits cannot be disregarded as they are, after all, what makes us human.

7. REFERENCES

- [1] Burns, C., Dishman, E., Verplank, W., & Lassiter, B. (1994). Actors, hairdos & videotape—Informance Design. In CHI'94 Conference Companion. New York: ACM Press.

- [2] Dunne, A. (1999). *Hertzian Tales: electronic products, aesthetic experience and critical design*. London: RCA CRD Research publications.
- [3] Frens, J.W. (1999). *Design of a portable appointment manager which considers content and emotional value of appointments*. Master's thesis. Delft University of Technology.
- [4] Overbeeke, C.J., Djajadiningrat, J.P., Wensveen, S.A.G., & Hummels, C.C.M. (1999). *Experiential and Respectful*. Proceedings of the International Conference 'Useful and Critical'. UIAH, Helsinki.