STEPHAN WENSVEEN AND KEES OVERBEEKE

CHAPTER 24

FUN WITH YOUR ALARM CLOCK: DESIGNING FOR ENGAGING EXPERIENCES THROUGH EMOTIONALLY RICH INTERACTION

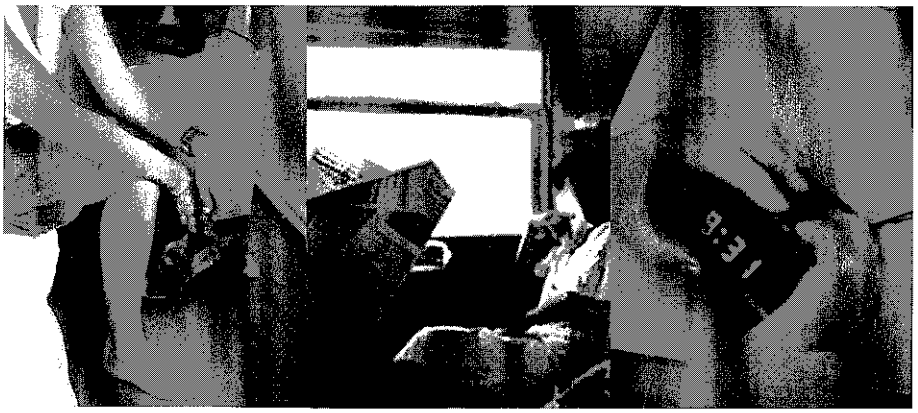

Figure 1. *From the edge of her bed Sophie throws her high heels in the corner of the room. It has been her first week at her first real job and she's not used to wearing them every day. She's also not used to working such long hours. Getting up at six and not being home before eight, is not her thing. Like today, that annoying Phil guy had her work till nine, on a Friday! And then that terrible train ride. Tonight she can get some real sleep and lie in. She still sets her alarm clock, because tomorrow she arranged to meet with her Mum. They'll go shopping in the spring sale. While one finger is pressing down the button that reads 'alarm', another is pushing the 'hour' button three times and then the 'minute' button another 30 times. The display reads 9:31; she shrugs, releases the 'alarm' button and flicks the tiny switch to 'on'. "Who designs these dumb products?" she mutters...*

To strive for the incorporation of fun in product use is to design for engaging experiences. In order to do this we should respect all human skills in human-product interaction. So while most current electronic products appeal to cognitive skills, we believe that a person's perceptual-motor and emotional skills should be taken into account as well. One way of opening up such an experience is to allow people to use their natural expressive powers by permitting them to use their perceptual-motor

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skills. Most current products do not tap into these skills because their functionality is accessible in just one way, and often a very poor way indeed. For example, to set Sophie's alarm clock, you have to push a tiny button several times, while holding another tiny button. Why not go one step further and try to design products that can adapt to a person's emotions and feelings to enrich the experience? If Sophie were able to express her feelings to the product, it could read these feelings and consider them when reacting to her.

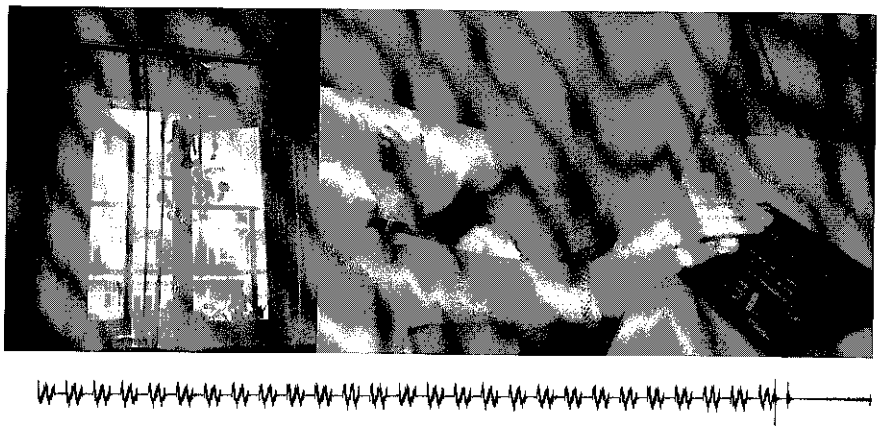

Figure 2. *The sunny Saturday morning is rudely disturbed by an annoying sound. Tuut...tuut...tuut...tuut...tuut...tu.. Sophie smacks the alarm. With her stretched out hand still resting on the alarm clock she tries to regain her consciousness. Through the slits in her eyes she sees sunlight, startled, she sits up straight, but then remembers it's only Saturday. She smiles, shakes her head thinking: "I hate these stupid products!"*

For many people waking up and getting out of bed is not the most pleasant experience. The accompanying product, the alarm clock doesn't really help. Yes, it does wake you up, when you have set it properly, but it doesn't adapt at all to different situations. It is a perfect example of a product that should adapt to the diversity of emotional experiences. It is also a product with a simple functionality yet it has all the features of the current interface malaise, like a lack of politeness and nonsensical buttons (Cooper, 1999). That is why we chose the alarm clock as a vehicle for our research through design approach. In our research towards designing emotionally intelligent products we advocate designs that both allow for the recognition and expression of emotion while avoiding anthropomorphic design (talking heads) and physiological sensors. This product design-driven approach takes the interaction with the product as the starting point for the detection of emotion.

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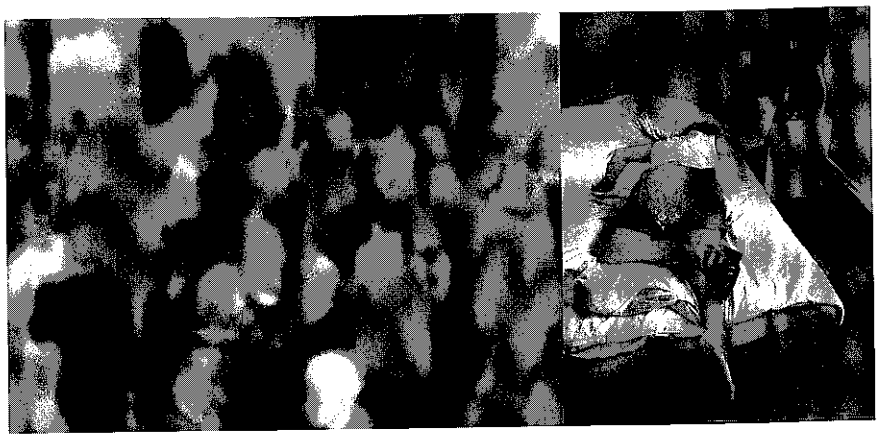

Figure 3. *Sophie slams the door behind her and stumbles into the bedroom. While fidgeting with the strap of her high heels she falls on her bed. At the cocktail party celebrating Phil's farewell she had behaved like a fool. At first she had ignored him, giving him the cold shoulder. But after a few drinks she confronted him and tried to tell him what she really thought of him. Phil just gave her a blank look and that made her angrier. Luckily, a colleague saw her behaving badly and took her away from the party just in time. She gave Sophie a lift home. But tomorrow she has to take that terrible train again. With one hand she reaches for her alarm. It looks like a purple disc with slider knobs. Her dad gave it to her a few weeks ago after she had wrecked her old one hitting it too hard out of frustration.*

The mood or emotional state you are in colours the way you interact with the world. For human-human communication this expression of emotion is essential. People express emotion through behaviour. In human-product communication people express their emotion as well, e.g., by slamming a door, shoving a chair away, or encouraging the printer with 'come on you can do it!'. Yet this behaviour does not enhance communication between user and product at all. On the contrary, if we fully express our negative emotion we might break the product.

In our product design-driven approach we take the interaction with the product as the starting point for the detection of emotion. While you interact with the product to communicate 'factual' information like the alarm time, the product senses your emotions from the way you handle it.

To make this possible we designed an alarm clock that meets the following three conditions:

1. It elicits rich emotional behaviour while the user communicates 'factual' information.
2. It has the ability to recognise this emotional behaviour.
3. It reflects and understands the expressed emotion.

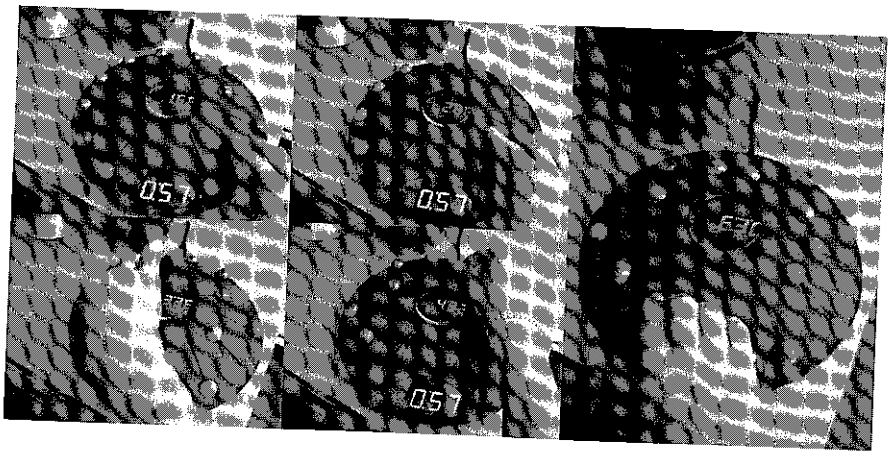

Figure 4. *She feels the round knobs and slides a couple of them towards the middle. At the party did she and Phil...? No?! She sits up and randomly starts to slide one or two sliders with each action. Using one hand she keeps sliding until she notices that the display shows 7:56. She pauses for a moment and thinks about tomorrow's 11 o'clock meeting with her new boss. She then slides the bottom two sliders all the way back to the outside. The display now shows 6:30. She waits and then firmly pushes the central button.*

Expressing emotions presupposes freedom of expression, and we therefore designed the alarm clock to allow for freedom in interaction. It offers a myriad of ways of setting the "factual" information i.e., the wake up time. People can choose to set it by displacing as many sliders as they can grasp or by sliding one slider at a time. This behavioural freedom affords emotions to influence and colour behaviour. The freedom of interaction is further enhanced by the fact that sliders can go back and forth. It stimulates playful interaction, as sliding actions are easily reversed and don't have serious consequences.

We demonstrated in an experiment the alarm clock's ability to recognise this behaviour and identify a person's mood from the interaction. We refer the interested reader to Wensveen, Overbeeke and Djajadiningrat (2002) as this goes beyond the scope of this chapter.

When expressing emotions it is important that the receiver gives some sort of feedback that the communication has succeeded. When Sophie expressed her feelings to Phil, his blank look only made her more angry. Just like people, products too should give some sort of reflection of the emotion, a sign of empathy, a sign of understanding. We therefore believe that different emotions should leave different behavioural traces on the product. A slap or a caress leaves a different trace on a face. Likewise, setting the time in a different mood leaves a different trace on the alarm clock. In our design the central display offers augmented feedback about the wake up time (factual information). But it is the successive patterns of the sliders that reflect the influence the emotion had on the setting behaviour leading to this wake up time. It is because of the richness of the inherent feedback that these traces

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can be perceived. Inherent feedback can be defined as "information provided as a natural consequence of making an action. It arises from the movement itself" (Laurillard, 1993).

Based on the interaction of setting the alarm in the late evening and the time-related aspects (alarm time, hours of sleep) the alarm clock makes a decision about what it believes is an appropriate sound. The next morning the alarm wakes you with this sound. The choice of this sound makes it clear that the alarm understood you. It shows its ability to adapt to the situation in an appropriate way.

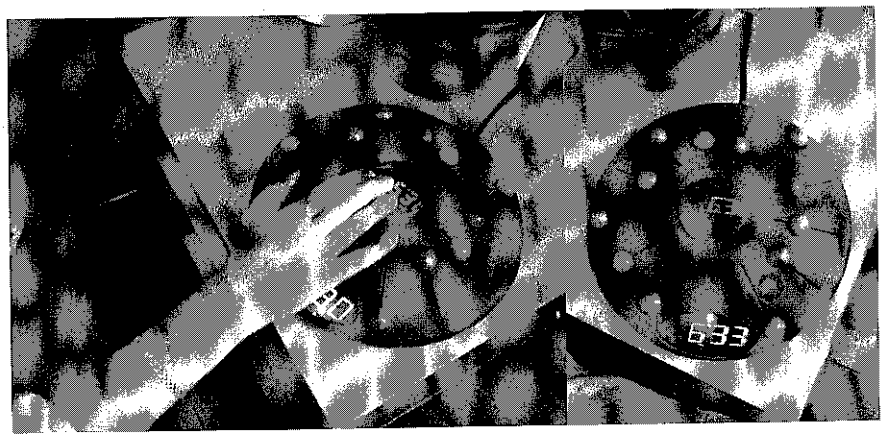

Figure 5. *Rooooo... roo... Sophie hears the sound but it stopped before she realises what it is. She pulls the blanket a bit higher over her head. Roooo... rooo... roo... It seems to be more urgent this time. Rooo... roo... roo... By now she realises it's her alarm clock. She stretches her hand and touches the snooze button. The sound stops. When she looks at the alarm she sees the display showing 6:30. The pattern of sliders looks chaotic. She smiles, thinking that it looks a bit how it feels inside her head.*

It is important that the alarm clock knows the essential information, at what time you need to wake up. It is of less importance that the product exactly knows your emotions as long as you can teach the product how you function. In order for the product to learn about the decisions it took, whether they are appropriate or not, it needs feedback about these decisions. Again through a person's behaviour the product can receive this feedback by the way the snooze button is pressed by the user to turn off the alarm sound. The combination of the delay time (the time between starting and turning off the sound) and a person's behaviour of pressing or hitting the snooze button provides valuable information for the decision making system.

Next morning the inherent feedback in the form of the final slider pattern proves its importance again. Because the end pattern is still present and it is a reflection of last night's behaviour it provides feedback about the decision. It offers people the possibility of linking the alarm sound and the expression of the end pattern together.

This doesn't imply a one to one relationship between the expression of the sound and the expression of the end pattern. After all setting the alarm after a stressful night leading to a disorderly pattern should not result in a chaotic sounding alarm the next morning.

The slider pattern changes the appearance of the alarm clock and provides feedback for the user and insight into how decisions are made. Since it is the only perceivable change in the alarm clock it provides a reason for the user to believe there is causality between the slider pattern and the alarm sound.

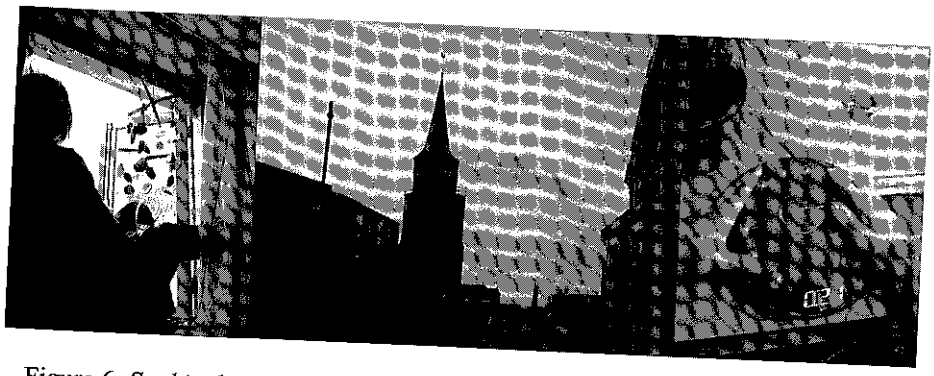

Figure 6. *Sophie draws the curtains from her balcony door. After she came home from work she drank some Italian rosé, watched the sunset and just enjoyed a warm autumn night. Setting her alarm she uses both hands and with gentle even actions makes a smooth and symmetrical pattern to set the alarm time to the usual 7:15.*

The design of the alarm clock illustrates the importance of a tight coupling between action and appearance in interaction design. It distinguishes itself from current electronic products through traces and inherent feedback. Because of the inherent feedback the traces become visible, are made explicit for the user and guide her behaviour. For example, when using both hands on the sliders in an even and balanced way the resulting pattern is symmetrical and smooth. The way this pattern looks will push the user to either heighten the symmetry and smoothness or disrupt them depending on how she feels. Traces and inherent feedback thus work in synergy. Without inherent feedback using traces is meaningless, as the product cannot guide the user's behaviour: the trace is invisible and cannot invite the user to act in an emotionally rich manner. Next morning the inherent feedback also offers valuable information for the user and gives insight into the decision-making system of the alarm clock.

From our product design perspective, the appearance of interactive products can no longer be considered as arbitrary. Appearance and interaction need to be designed concurrently.

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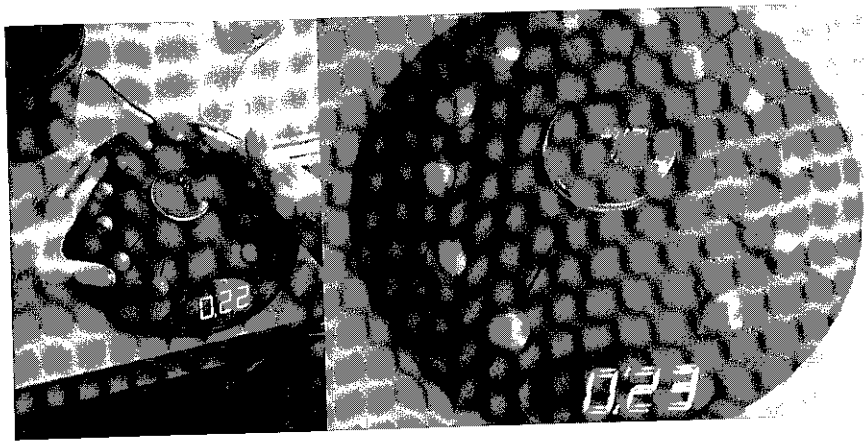

Figure 7. *Being a bit tipsy and feeling naughty she dents the smooth pattern with one swift move. The display shoots from 7:15 to 7:43. She adjusts one slider to set it to 7:25. "I wonder what that will do?"*

When you combine freedom of interaction, rich inherent feedback (slider patterns) loosely coupled with generated feedback (changing alarm sounds) and a system that tries to adapt to and can learn from specific situations you have a good recipe for an engaging experience. It invokes curiosity and playful interaction and maybe, maybe it offers us a recipe for having fun with our alarm clock too.

Twiiiiingwiiiiing... priit... twiiiiiiiingwiiiiing ... priit... the soft sound reaches Sophie. When she hears the sound appear for a second time she gently strokes the snooze button. She pulls the blankets away, sits up straight and reaches for her alarm. She looks at the pattern while replaying the sound in her head. "Funny..." she thinks and pushes all the sliders to the outside to avoid the sound from playing again. "...at least we understand each other."

She steps over the empty bottle of rosé, giggles and walks to the shower.

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