

## CHAPTER 3

*The Thing and I (Spring of '17 Remix)*

## 1. INTRODUCTION

Around the turn of the millennium, more than 15 years ago, the Human-Computer Interaction (HCI) community found an interest in a slightly esoteric concept called *user experience* (UX). Up to then, effective and efficient goal achievement had been HCI's prime objective and HCI experts mocked apparent follies of designers committed in the name of aesthetics. But doubts crept in. There were so many examples of more mature, consumer-oriented technologies, such as automobiles, which had to be usable and at the same time beautiful, exciting and ever new. In fact, already in 1998 *Apple* had been successful with an unusual consumer-oriented industrial design for a computer, the colorful *iMac G3s*. The "experiential" made its appearance.

In the 1990s, experiential marketing pointed out that customers want products "that dazzle their senses, touch their hearts and stimulate their minds" (Schmitt, 1999, p. 22), the experience economy (Pine & Gilmore, 1999) highlighted the economic value of experiences, and the experience society (Schulze, 1992) discussed a general societal shift from the material to the experiential. Suddenly, experience mattered. HCI became interested in how people "feel" while and as a consequence of engaging with technology. For a while, the mainstream of HCI defended its image as consisting of the most sober and reasonable (some would say boring) people around. Those pointed out that goal achievement feels good as well, that satisfaction *is* an emotion and that it is all already in ISO 9241-11. However, others felt the need to broaden their perspective. Notions such as "fun" (Carroll & Thomas, 1988; Draper, 1999), "pleasure" (Jordan, 2000), the "hedonic" (Hassenzahl, Platz, Burmester, & Lehner, 2000) and the "ludic" (Gaver & Martin, 2000) entered the HCI literature. What they had in common was a call for a holistic perspective and an enrichment of traditional quality models with non-utilitarian concepts.

On a personal note, the change of perspective in HCI had been thrilling for me. Back then, I was working as a usability engineer in the competence center for user interface design at *Siemens* corporate technology. The whole idea of "fun" seemed hilarious in this environment. Yet, in our department Michael Burmester headed a research project on computer games and operator interfaces, very much in the spirit of Carroll and Thomas' (1988) "Fun" paper. Axel Platz worked on beautiful interfaces for medical imaging systems, which posed challenges to my notion of usability and the tools, I used to conceptualize and measure quality. I remember travelling to York in 1999 to attend one of Andrew Monk's "Computers and Fun" workshops, feeling at home in a small crowd of HCI researchers interested in going "beyond usability". And in fact, I presented the first paper on hedonic quality (Hassenzahl et al., 2000), which led to this chapter and many more (Diefenbach, Kolb, & Hassenzahl, 2014), on the CHI conference in The Hague in 2000 in the very same session as Bill Gaver presented a sketchbook full of alternative conceptual devices, such as a dawn chorus, a (de)tour guide, an intimate view, a dream communicator, or a worry stone (Gaver & Martin, 2000). (If you have no clue what all these things are, please take a look at the paper.) These had been powerful influences.

While I became more and more enthusiastic, the engineers and clients around me remained sceptic. What was needed was a model to describe what this "fun" could be, how it relates to good ol' usability, as well as a way to measure it and its presumed impact on users' acceptance. As a consequence, I formulated a model which was the focus of the original chapter "The Thing and I" (Hassenzahl, 2003).

The present chapter is a remix of this chapter. Beloved *Wikipedia* defines a remix as "a piece of media, which has been altered from its original state by adding, removing, and/or changing pieces of the item." In the spirit of this definition, I will present the original model, but will add and change pieces to gain room for updates and comments. Similar to a good remix, this chapter is not to replace the original. It is maybe the most fun to read both versions in one go – supposed you'll find the time.

## 2. A FIRST, PROCESS-ORIENTED MODEL OF USER EXPERIENCE

Figure 1 shows the key elements of the initial, process-oriented model from (a) a designer perspective and (b) a user perspective.

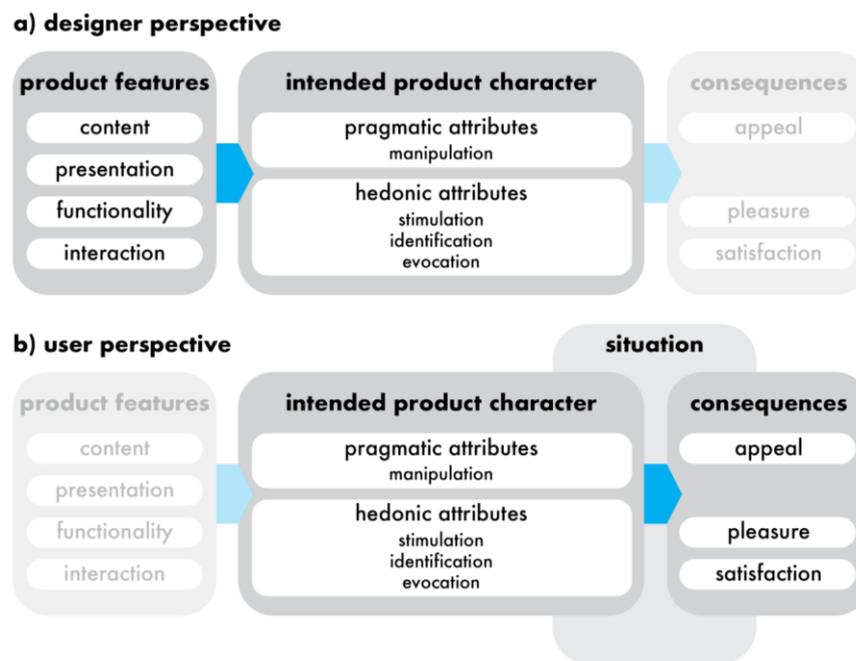


Figure 1. *Key elements of the first process-oriented model from (a) a designer perspective and (b) a user perspective (for details refer to text).*

When designing a product, designers choose and combine features (content, presentation, functionality, interaction) to convey a product character (or gestalt; Janlert & Stolterman, 1997). Note that the particular character is only *intended*. There is no guarantee that users will actually perceive and appreciate the product the way designers wanted it to be perceived and appreciated. When users come in contact with a product, they take in its features and construct an *apparent* product character. Product characters can be described by attributes, such as simple, predictable, novel or interesting.

In general, the model distinguishes two broad groups of attributes. *Pragmatic quality* refers to a product's perceived ability to support the effective and efficient achievement of tasks (i.e., a subjective version of usability). *Hedonic quality* refers to a product's perceived ability create "pleasure". In the first version of the model, I identified stimulation (e.g., through a product's novelty), identification (e.g., through

a product's apparent professionalism) and evocation (e.g., through precious memories associated with the product) as the main sources of the hedonic. However, later studies focused on stimulation and identification only. To research the model, colleagues and I devised a number of semantic differential scales to measure pragmatic and hedonic quality perceptions, most notably the *AttrakDiff2* (Hassenzahl, Burmester, & Koller, 2003, [www.attrakdiff.de](http://www.attrakdiff.de)) and an abridged version (Hassenzahl & Monk, 2010).

Perceptions of character can vary. What seems novel and stimulating to one person, may appear lame to the other. Such variations *between* individuals can be explained by differing standards. The apparent character can also change *within* a person over time. For example, a product perceived as new and stimulating in the beginning may lose some ability to stimulate over time. Conversely, with increasing expertise, products initially perceived as hard to use may become more familiar and, thus, might be perceived as easier. In fact, there is a growing body of research, which takes a dynamic perspective on user experience (e.g., Karapanos, Zimmerman, Forlizzi, & Martens, 2009) with methods such as retrospective interviewing (e.g., *iScale*, Karapanos, Martens, & Hassenzahl, 2012) or true longitudinal measurement (Harbich & Hassenzahl, 2017). The suggestion is that the quality of an interactive product is best captured by the *shape* of change in perceptions over time (see Hassenzahl, 2010, p. 19 for more examples). In Harbich and Hassenzahl's (2017) study, for example, the hedonic decreased over time, with accelerated rates for people considered to be more playful. While novelty inevitable tends to wear off, the rate and shape of this and moderating aspects of users and products maybe a more important to know than mere initial levels.

The apparent product character will mediate a number of consequences, such as potential judgments about the product's general goodness (e.g., "It is good/bad"), emotional consequences (e.g., pleasure, satisfaction) and behavioral consequences (e.g., increased time spend with the product). Originally, I simply wanted to show that pragmatic and hedonic quality are different and that *both* are important for predicting consequences. Overall, this was the case. For instance, in Hassenzahl (2001) pragmatic and hedonic quality perceptions of different screen types were independent of each other. While pragmatic quality was highly correlated with a measure of mental effort ( $r=-.61$ ), hedonic quality was not ( $r=.01$ ). But both predicted appeal with an almost equal weight (pragmatic:  $\beta=.62$ , hedonic:  $\beta=.61$ ). This explained a puzzling personal experience. Back then, I sat through hours of usability tests, watching participants struggle with various problems. Although they were aware of a lack of usability, they often remained quite enthusiastic about the product. My professional tunnel vision left me clueless: Why do people bother with a piece of technology that obviously does not perform as best as it could? Now I began to understand that there might be other sources of appeal. Overall, usability might not be as important as I always thought.

While the notion of pragmatic and hedonic quality contributing equally to consequences appeared a good start, it seemed obvious that the importance of the one or the other will vary with the specific usage situation. Consider an automated teller machine (ATM) designed to be especially learnable. To achieve this, the process of receiving money is divided into a number of small steps. Users will certainly value this. Now imagine users under time pressure. The succession of small steps inevitably slows down interaction, and while the ATM is still perceived as learnable, this attribute is not relevant at the moment. It rather frustrates than satisfies. In this example, consequences strongly vary with the particular usage situation, while the perception of the ATM as learnable remains stable. This susceptibility of emotional responses and the judgments of appeal or "goodness" to variation caused by the situation is an argument for separating potentials for consequences (i.e., the perceived product character) from the actual consequences. Perceptions are more stable and, thus, more reliable. In addition, for designers it is not sufficient to know *that* users find a product appealing. They need to know *why*. As consequence it is more interesting to focus on the product character and usage situations than on consequences. This is why simple outcome measures, such as Reichheld's (2003) *Net*

*Promoter Score*, are of limited use when it comes to design. Note that this is not to imply that appeal and emotional responses are unimportant. Both will certainly affect future use of the product.

The usage situation as a crucial moderator of the link between product perceptions and consequences poses a serious challenge. Designers need to have an idea of how a particular character will be experienced in a particular situation. However, situations are plenty. As a solution to this, I proposed to focus on the metamotivational state of users – their *usage mode* – rather than the situation.

I distinguished two modes: a *goal mode* and an *action mode* (Hassenzahl, Kekez, & Burmester, 2002) inspired by Apter's (1989) *Reversal Theory* (see Fokkinga & Desmet, 2014 for more on *Reversal Theory* in the context of design). The notion of usage modes assumes that interaction *always* consists of behavioral goals and action to fulfil these goals. However, in *goal mode* goal fulfilment is in the fore. The current goal has a certain importance and strongly determines all action. Using the product is "a means to an end". Individuals try to be effective and efficient. They describe themselves as "serious" and "planning". Low arousal is preferred and experienced as relaxation. If arousal increases (e.g., because of a usability problem, which circumvents goal fulfilment), it is experienced as mounting anxiety (frustration). In *action mode* the action is in the fore. The current action determines goals "on the fly"; the goals are "volatile". Using the product can be an "end in itself". Effectiveness and efficiency do not play an important role. Individuals describe themselves as "playful" and "spontaneous". High arousal is preferred and experienced as excitement. If arousal decreases (because of a lack of stimulation) it is experienced as increasing boredom. Usage modes are psychological states and products can be experienced in either state. While the perception of a product character as primarily pragmatic or hedonic will not be influenced by the usage mode, consequences will depend on the product's momentary fit to the usage mode. While in the original chapter this remained a hypothesis, a number of later studies explored this idea empirically (Hassenzahl, Kekez, & Burmester, 2002; Hassenzahl & Ullrich, 2007; Hassenzahl, Schobel, & Trautmann, 2008; van Schaik & Ling, 2011). For example, Hassenzahl and Ullrich (2007) let half of the participants use software with a number of predetermined goals (i.e., goal mode, a typical usability testing set up). The other half was free to explore and to set their own goals (action mode). In goal mode, the more mental effort people experienced, the more negative they felt and the poorer the product evaluation. Spontaneity was experienced as negative. In action mode, however, spontaneity was experienced as positive and became highly related to a positive product evaluation, while mental effort became dissociated from product evaluation.

In principle, the initial model was a process model. It defined crucial constructs and their relationships and then described how users perceive and value a product. While certainly helpful at that time, especially for "measuring" user experience, from a design perspective the process is not the most interesting. It is rather the *content* that matters. The crude distinction between hedonic and pragmatic qualities was certainly a first step into that direction. However, it seemed necessary to better understand potentially different types of positive experiences and how those could be shaped through technology by design.

### 3. A SECOND, CONTENT-ORIENTED MODEL OF USER EXPERIENCE

#### 2.1 Overview of the model

The second model of user experience (Hassenzahl, 2010) started from the notion of action.



Figure 2. Key elements of the second, content-oriented model (for details refer to text).

Many psychological theories of action distinguish different levels of action regulation. Carver and Scheier (1998), for example, postulate be-goals, do-goals and motor-goals. *Motor-goals* are on the sensorimotor level. They address concrete, detailed operations, such as pressing a button or reading an instruction. This level of action is heavily dependent on the physical product and the momentary context of use. It is the level of "How" and in most cases the most obvious concern of interaction design. If a designer devises a particular arrangement of graphical elements on a touchscreen to be swiped and touched by a user, the designer designed action on a motor-level, i.e., "arranged" motor-goals. Arrangements of motor goals, however, are operated to fulfill a do-goal, such as making a telephone call. This is the level of "What". From a product perspective, this level is more concerned with the functionality offered by a product than with details of the interaction with this functionality. These two levels, do-goals and motor-goals, the "What" and the "How", capture the mainstream understanding of what HCI was supposed to be about.

However, there is a third level of goals, the so-called be goals, such as to feel close to relevant others. They are the motives behind do-goals, thereby providing meaning to action. They are the level of "Why". In HCI the "Why", that is, motives, needs, or be-goals, never received much attention. Two chapters of Kaptelinin and Nardi's (2006) book on *Activity Theory*, an in HCI popular theory of action, only begin to address basic questions of the relationship between motives (i.e., be-goals) and actions (for example, whether there is a one-to-one relation between motive and action or a many-to-one). McCarthy and Wright's (2004, p. 85) model of experience only broadly asserts that all our activities are "shot through with values, needs, desires, and goals". I argued elsewhere that "[u]nderstanding action in terms of motives fulfilled is crucial to an experiential approach to design. Brewing the morning coffee because of a need for routine is different from brewing it because of expressing your affection for your loved one through caring. Although the action appears the same, the newly designed, especially efficient coffee maker will certainly fail to support a need for routine (it actually may take it away), whereas the same coffeemaker may give me some extra minutes to spend with my spouse in the morning (but may actually ruin the symbol of caring because the less invested the less it might be valued)" (Hassenzahl, 2010, p. 45). Unfortunately, Carver and Scheier's model is a process model and silent about the potential content of be-goals. The same is true for *Activity Theory* or McCarthy and Wright's model of experience. They postulate motives or needs as theoretical

entities, but remains silent about the potential content of those motives.

Fortunately, there is research into the different type of needs (i.e., motives). Sheldon and colleagues (2001) reviewed a number of need theories and provided 10 candidates: Autonomy/Independence, Competence/Effectance, Relatedness/Belongingness, Self-actualizing/Meaning, Security/Control, Money/Luxury, Influence/Popularity, Physical thriving/bodily, Self-esteem/Self-respect, Pleasure/Stimulation. Sheldon and colleagues not only provided a neat list of needs, but also a questionnaire to measure the saliency of experienced need fulfillment retrospectively.

Inspired by this work, we reduced the list a little to autonomy, competence, relatedness, stimulation, popularity, security, and meaning and began to apply it to the experience of interactive products (Hassenzahl, 2008; Hassenzahl, Diefenbach, & Göritz, 2010; Hassenzahl, Wiklund-Engblom, Bengs, Hägglund, & Diefenbach, 2015). We asked people to remember a positive experience in which an interactive technology played a role and measured experienced affect and need fulfillment. In general, we found people capable of distinguishing between different types of needs. In addition, need fulfillment was correlated with affect – the more intense need fulfillment, the more positive the experience. Particular needs revealed particular patterns. For example, competence experience was not only related to positive affect, but also to negative affect. This underlines that to feel competent calls for a certain amount of challenge, which implies episodes of inconvenience and extra effort as well as being afraid of a failures. In contrast, security showed the lowest correlation with positive affect, highlighting its nature as a "deficiency need". Security may be the most salient, when it becomes threatened. In addition, all studies revealed a clear link between need fulfillment and the perception of the product as hedonic, while need fulfillment was less clearly or not at all related to pragmatic quality. In Hassenzahl et al. (2015), for example, the correlation between need fulfillment and hedonic quality was significant ( $r=.27$ ), but the correlation between need fulfillment and pragmatic quality was not ( $r=.04$ ). All in all, needs provide a collection of discernible sources of positive experience related to hedonic product perception.

Other researchers in HCI took up the concept of needs and provided a number of further studies. For example, Partala and Kallinen (2012) extended our earlier research to negative experiences. In another study, Partala (2011) compared virtual life (in Linden Lab's *Second Life*) and real life in terms of need fulfillment. In virtual life, people experienced more autonomy, more luxury and more physical thriving (since one can shape one's virtual body in line with personal preference). In real life, there was more competence, relatedness, security and popularity. Karapanos and colleagues studied the meaning of *Facebook*, *WhatsApp* and different activity trackers through the lens of psychological needs (Karapanos, Gouveia, Hassenzahl, & Forlizzi, 2016; Karapanos, Teixeira, & Gouveia, 2016). Needs are useful to better understand the different qualities of enjoyable and meaningful experiences. Of course, the particular selection of needs provided by the second model can be debated. Partala und Kujala (2016) recently provided a study based on ten universal values (Schwartz & Bilsky, 1987), such as achievement, stimulation, power, security, or benevolence. However, since needs are conceptualized as universal, as "innate psychological nutrients that are essential for ongoing psychological growth, integrity, and well-being" (Deci & Ryan, 2000, p. 229) they are closely tied to our very human nature. As a consequence, need theories (Deci & Ryan, 2000; Maslow, 1954; Reiss, 2004; Schwartz & Bilsky, 1987) tend to substantially overlap. I believe that the seven categories proposed by the second model (i.e., autonomy, competence, relatedness, stimulation, popularity, security, physical thriving, and meaning) cover substantial ground.

## 2.2 User experience and wellbeing

Note that Deci and Ryan's definition of a need as "essential for growth, integrity and wellbeing" already provides an explicit link to psychological wellbeing (i.e., happiness). In fact, Diener, Oishi, and Lucas (2009) offered "need and goal

satisfaction theories" as one of the two major theoretical explanations for differences in levels of happiness among people (beyond genetic predisposition). In this sense, the second model is already a model of a *wellbeing-oriented* design of technology. While the first, process-oriented model justified hedonic quality rather implicitly by promising improved acceptance by users/consumers, the second model set wellbeing as an explicit goal. "Experiences make us happier" was one out of three reasons, I provided to justify caring about user experience (Hassenzahl, 2010). Nowadays, "design for wellbeing" or "positive design" has become broadly discussed, with a growing body of research, examples and design-oriented tools (Calvo & Peters, 2014; Desmet & Pohlmeier, 2013; Hassenzahl et al., 2013).

The concept of wellbeing integrated in the present model is one that understands everyday activity as an important source of happiness (Lyubomirsky, Sheldon, & Schkade, 2005). The right activities ("What"), done in the right way ("How") are likely to touch upon need fulfillment and will create moments of pleasure and meaning. Psychological wellbeing is understood as the consequence of experiencing these moments regularly. Since almost all human activity is not only mediated by technology, but actively construed in terms of the technology (Kaptelinin & Nardi, 2006; Reckwitz, 2002), design provides a powerful mechanism to shape activities, experiences and ultimately wellbeing.

### 2.3 *On the relationship between experience and interaction*

The hierarchy of the "Why", the "What" and the "How" featured by the model implies a relationship between levels. In general, we assume that the "Why", that is, needs (e.g., to feel stimulated, to feel related) and the envisioned experience, must be determined first to become able to choose functionality (the "What") and to determine the appropriate detailed form and interaction (the "How") in line with the experience. In other words, without a clear picture of the experience to be created, the "material" cannot be specified.

Such a notion assumes that there are no generally valid design solution on lower levels. For example, efficiency may be an important aspect of many technology-mediated activities, but not all. The experience of closeness between couples in long-distance relationships enabled by technology may require less attention to efficiency than a time-critical, competence-oriented activity. In fact, applying an overall rule to all situations may even be harmful. The sometimes thoughtless application of efficiency-oriented practices acquired at work to private life are certainly at the heart of phenomena, such as "time poverty", and counter movements, such as practicing mindfulness and cherishing the moment.

Recently, we engaged in a line of studies to more systematically explore the relationship between the experiential level (the "Why") and lower levels (predominantly the "How") (Diefenbach et al., 2017; Lenz, Diefenbach, & Hassenzahl, 2013; Lenz, Hassenzahl, & Diefenbach, 2017, in press). In one study (Diefenbach et al., 2017), we designed a digital picture frame for an office workplace, which allows to keep and consume a secret picture. Keeping the small secret and revealing it in an undisturbed moment on a busy office day was supposed to create an experience of autonomy and privacy. Specifically, we compared two different ways of interacting with the picture. One was quite technical – the user could reveal and hide the picture with the press of a button. For the other, we first asked individuals to describe how interacting with a secret feels good and especially secretive. They described how they approach the secret slowly and appreciative, that they require an instantaneous way of hiding the secret and that they feel an urge to physically touch it. We transformed this into a particular touch interaction for the picture frame. Upon putting the finger on the screen of the frame, a part of the secret picture appears just under the fingertip. Moving the finger reveals the picture further. The moment the finger leaves the screen, the exposed parts of the secret picture disappear again. Participants saw video prototypes of both interactions and were asked to imagine using the frame in their office with a picture of their choice. The results showed that participants not only believed that the experience when using the touch interaction

would be more positive, but also that the experience in itself would provide a more intense feeling of autonomy and privacy. This supports the notion of a necessary fit between low-level interaction and envisioned experience.

#### 2.4 Three points for discussion

Finally, I want to briefly clarify my position on three points for discussion, which constantly crept up over the years in personal communications and other authors' writings about user experience: (1) The role of instrumentality, (2) the difference between experiences *mediated through* a product and the experience *of* a product and (3) whether experiences are designable.

*The role of instrumentality.* In Hassenzahl (2010), I used the example of high heels to show how easy it is to misunderstand instrumentality. Since high heels belong to the category of shoes, one may automatically associate them with the major purpose of shoes – to support walking. Obviously, high heels are bad for this and thus utterly useless and unusable. However, the real purpose of a high heel is to look good, to be admired and desired. Consequently, whether a particular high heel "functions" or not, that is, whether it is instrumental or not, rests solely on its ability to create the experience of being admired and desired (i.e., popularity, relatedness). Comfy walking is simply not an issue here. This underlines the importance of making explicit the envisioned experiences to be created through a product, since instrumentality can only be understood in relation to these experiences.

*Experiences mediated through a product versus experience of a product.* In my practice, I found industries' interest in user experience mainly driven by the desire to reshape the experience *of* their product. Quite understandably, they look for a "wow" to differentiate from competitors. Personally, I don't believe products should be an experience in themselves. They should provide the functionality and interaction to *create* and *mediate* enjoyable and meaningful everyday experiences. That's how they become meaningful in the long run. Of course, especially early adopters thrive on the stimulation, popularity and competence reaped from trying out cool, new gear. People buy activity trackers, smart watches, robots, virtual reality goggles or apps just to check them out, to stay on the ball, but not because they promise particular meaningful everyday experiences. One could argue that there is nothing to object to. If relishing the novel (stimulation), appearing cool (popularity) and evolving one's skills to master technology (competence) is the outcome of all this, people simply work their happiness levels. However, this strategy will eventually lead (or has already led) to an unhealthy succession of the ever new. We do not long for a new smartphone because it is better (although the rhetoric around it suggests so), but simply because it is new. This is a wasteful strategy in terms of resources and bound to make people unhappy. Focusing on the experiences emerging from activities may inspire less material-intensive ways of creating these experiences and emphasizes alternative, less fleeting sources of wellbeing beyond stimulation.

*Are experiences designable?* Some in the field of HCI understand experiences as not designable. For example, Kaptelinin and Bannon (2012, p. 296) state that [o]ne cannot design – or 'give shape to' – something that is outside one's direct control. Therefore, one cannot design human activities and experiences: They are personal, situated, emergent phenomena that cannot be shaped, or even completely anticipated in advance" (p. 296). One can only design *for* an experience (e.g., provide the necessary ingredients and infrastructures), but not the experience in itself. I tend to disagree. All in all, we should understand an experience as an immaterial outcome, which can be at least envisioned in an ideal "form". This is already an act of design. If then all elements pliable are arranged in a way to create this experience, it becomes inscribed into and expressed through material arrangements. Again an act of design, even if not all elements are under full control. And while there is no guarantee that an experience emerges exactly as envisioned, it is not unlikely that due to a shared

cultural understanding, experiences become meaningful for those people, they had been designed for. This is at least the basic hope of everybody throwing a birthday party: That the guests will relish the experience arranged for them. If this does not happen, there is certainly a lack of understanding between the "designer" and the "user". But this is not a novel phenomenon, and basically the reason for working empirically in experience design and HCI.

#### 4. CONCLUSION

Nowadays, "good" user experience is a broadly accepted goal of design. While maybe not always completely understood and still riddled with conceptual inconsistencies, researchers and practitioners of HCI agree that experiences emerging from the interaction with technology are important, that these experiences should be worthwhile (i.e., positive), and that they are situated and dynamic, yet somehow "designable" through particular functionality, interaction and "form" bundled into a technology (Law, Roto, Hassenzahl, Vermeeren, & Korte, 2009).

In this chapter I presented my view on (user) experience. I understand psychological wellbeing as the ultimate goal of technology design, not efficiency. In his *Letter to Humanity*, Koert van Mensvoort (2017) from *Next Nature* writes: "Technology not only alters our environment, it ultimately alters us. The changes to come will allow you to be more human than ever before. What if we used technology to magnify our best human qualities and support us in our weaknesses? We could call such technology humane, for lack of a better word. Humane technology takes human needs as its starting point. It would play to our strengths rather than rendering us superfluous. It would expand our senses rather than blunting them. It would be attuned to our instincts; it would feel natural. Humane technology would not only serve individuals but, first of all, humanity as a whole." This neatly summarizes, what experience design is all about.

To make it happen requires an idea of where the positivity stems from. The set of psychological needs described above are an appropriate starting point, representing potential "Why's" of a technology use. They can serve as inspiration, guides and as a way to characterize or "evaluate" experiences. Ultimately, though, design requires a more specific understanding. Need fulfillment becomes only real when situated through activities. In turn, most of these activities involve technology. Technology is, thus, not only instrumental to the activity, but also substantially shapes it. Determining what to do in which way (the "What", the "How") to preserve and even strengthen need fulfillment and wellbeing (the "Why") is the overarching goal of my flavor of experience design.

The present models rely on a number of well-studied concepts mainly borrowed from psychology, applied and adapted to HCI. In itself, basic assumptions received some empirical validation beyond what psychology already knew (e.g., that need fulfillment is linked in a certain way to product perceptions). This certainly distinguishes it from many other frameworks whose basic assumptions never became systematically tested.

Admittedly, models are always reductions. They cannot and will not replace detailed inquiries into situations, practices and experience. But they systemize, spurn debates about what belongs and what not. Maybe more important, we found the model to be inspiring for our design work. There are a number of case studies ranging from automotive interaction design (e.g., Eckoldt, Hassenzahl, Laschke, & Knobel, 2013; Knobel et al., 2012) to kitchen appliances (Klapperich & Hassenzahl, 2016) as well as from communication in distributed families (Lenz et al., 2016) to communication among teenage boys (Laschke, Hassenzahl, & Mehnert, 2010). In all these cases, the model presented above served as grounding and inspiration. I sincerely hope that the ideas presented in this remix chapter will inspire your work, too – be it the design of technology-mediated experiences or attempts to further falsify, operationalize or improve models of experience.

#### 5. ACKNOWLEDGEMENTS

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## 6. REFERENCES

- Apter, M. J. (1989). *Reversal Theory: Motivation, Emotion and Personality*. Routledge.
- Calvo, R. A., & Peters, D. (2014). *Positive Computing: Technology for Wellbeing and Human Potential [Kindle Edition]*. MIT Press.
- Carroll, J. M., & Thomas, J. M. C. (1988). Fun. *ACM SIGCHI Bulletin*, 19(3), 21–24.
- Carver, C. S., & Scheier, M. F. (1998). *On the Self-Regulation of Behavior*. Cambridge University Press.
- Deci, E. L., & Ryan, R. (2000). The “What” and “Why” of Goal Pursuits: Human Needs and the Self-Determination of Behavior. *Psychological Inquiry*, 11(4), 227–268.
- Desmet, P. M. A., & Pohlmeier, A. E. (2013). Positive Design : An Introduction to Design for Subjective Well-Being, *International Journal of Design*, 7(3), 5–19.
- Diefenbach, S., Hassenzahl, M., Eckoldt, K., Hartung, L., Lenz, E., & Laschke, M. (2017). Designing for Well-Being: A Case Study of Keeping Small Secrets. *The Journal of Positive Psychology*, 12(2), 151–158.
- Diefenbach, S., Kolb, N., & Hassenzahl, M. (2014). The “Hedonic” in Human-Computer Interaction: History, Contributions, and Future Research Directions. In *Proceedings of the 2014 Conference on Designing Interactive Systems - DIS 14* (pp. 305–314). ACM Press.
- Diener, E., Oishi, S., & Lucas, R. (2009). Subjective Well-Being: The Science of Happiness and Life Satisfaction. In S. J. Lopez & C. R. Snyder (Eds.), *Oxford Handbook of Positive Psychology, 2nd edition* (pp. 187–194). Oxford University Press.
- Draper, S. W. (1999). Analysing Fun as a Candidate Software Requirement. *Personal and Ubiquitous Computing*, 3(3), 117–122.
- Eckoldt, K., Hassenzahl, M., Laschke, M., & Knobel, M. (2013). Alternatives: Exploring the Car’s Design Space from an Experience-Oriented Perspective. In *Proceedings of the 6th International Conference on Designing Pleasurable Products and Interfaces - DPPI '13* (pp. 156–164). ACM Press.
- Fokkinga, S., & Desmet, P. (2014). Reversal Theory from a Design Perspective. *Journal of Motivation, Emotion, and Personality*, 2(2), 12–26.
- Gaver, B., & Martin, H. (2000). Alternatives: Exploring Information Appliances through Conceptual Design proposals. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems - CHI 00* (pp. 209–216). ACM Press.
- Harbich, S., & Hassenzahl, M. (2017). User Experience in the Work Domain : A Longitudinal Field Study. *Interacting with Computers*, 29(3), 306–324.
- Hassenzahl, M. (2001). The Effect of Perceived Hedonic Quality on Product Appealingness. *International Journal of Human-Computer Interaction*, 13(4), 481–499.
- Hassenzahl, M. (2003). The Thing and I: Understanding the Relationship between User and Product. In M. Blythe, C. Overbeeke, A. F. Monk, & P. C. Wright (Eds.), *Funology: From Usability to Enjoyment* (pp. 31–42). Kluwer Academic Publishers.
- Hassenzahl, M. (2008). User experience (UX): towards an experiential perspective on product quality. In *Proceedings of the 20th International Conference of the Association Francophone d’Interaction Homme-Machine* (pp. 11–15). ACM Press.
- Hassenzahl, M. (2010). *Experience Design: Technology for All the Right Reasons*.

Morgan & Claypool.

Hassenzahl, M., Burmester, M., & Koller, F. (2003). AttrakDiff: Ein Fragebogen zur Messung wahrgenommener hedonischer und pragmatischer Qualität. In *Mensch & Computer 2003* (pp. 187–196). Teubner.

Hassenzahl, M., Diefenbach, S., & Göritz, A. (2010). Needs, Affect, and Interactive Products – Facets of User Experience. *Interacting with Computers*, 22(5), 353–362.

Hassenzahl, M., Eckoldt, K., Diefenbach, S., Laschke, M., Lenz, E., & Kim, J. (2013). Designing Moments of Meaning and Pleasure. Experience Design and Happiness. *International Journal of Design*, 7(3), 21–31.

Hassenzahl, M., Kekez, R., & Burmester, M. (2002). The importance of a software's pragmatic quality depends on usage modes. In *Proceedings of the 6th international conference on Work With Display Units - WWDU 2002* (pp. 275–276).

Hassenzahl, M., & Monk, A. (2010). The Inference of Perceived Usability From Beauty. *Human-Computer Interaction*, 25(3), 235–260.

Hassenzahl, M., Platz, A., Burmester, M., & Lehner, K. (2000). Hedonic and Ergonomic Quality Aspects Determine a Software's Appeal. *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems - CHI 00* (pp. 201–208). ACM Press.

Hassenzahl, M., Schöbel, M., & Trautmann, T. (2008). How Motivational Orientation Influences the Evaluation and Choice of Hedonic and Pragmatic Interactive Products: The Role of Regulatory Focus. *Interacting with Computers*, 20(4–5), 473–479.

Hassenzahl, M., & Ullrich, D. (2007). To Do or Not To Do: Differences in User Experience and Retrospective Judgments Depending on the Presence or Absence of Instrumental Goals. *Interacting with Computers*, 19(4), 429–437.

Hassenzahl, M., Wiklund-Engblom, A., Bengs, A., Häggglund, S., & Diefenbach, S. (2015). Experience-Oriented and Product-Oriented Evaluation: Psychological Need Fulfillment, Positive Affect, and Product Perception. *International Journal of Human-Computer Interaction*, 31(8), 530–544.

Janlert, L.-E., & Stolterman, E. (1997). The Character of Things. *Design Studies*, 18(3), 297–314.

Jordan, P. (2000). *Designing Pleasurable Products. An Introduction to the New Human Factors*. Taylor & Francis.

Kaptelinin, V., & Bannon, L. J. (2012). Interaction Design Beyond the Product: Creating Technology-Enhanced Activity Spaces. *Human-Computer Interaction*, 27(3), 277–309.

Kaptelinin, V., & Nardi, B. A. (2006). *Acting with Technology. Activity Theory and Interaction Design*. MIT Press.

Karapanos, E., Gouveia, R., Hassenzahl, M., & Forlizzi, J. (2016). Wellbeing in the Making: Peoples' Experiences with Wearable Activity Trackers. *Psychology of Well-Being: Theory, Research and Practice*, 6(4). <http://doi.org/10.1186/s13612-016-0042-6>

Karapanos, E., Martens, J.-B., & Hassenzahl, M. (2012). Reconstructing Experiences with iScale. *International Journal of Human-Computer Studies*, 70(11), 849–865.

Karapanos, E., Teixeira, P., & Gouveia, R. (2016). Need fulfillment and Experiences on Social Media: A Case on Facebook and WhatsApp. *Computers in Human Behavior*, 55(Feb), 888–897.

Karapanos, E., Zimmerman, J., Forlizzi, J., & Martens, J. (2009). User Experience Over Time: An Initial Framework. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (pp. 729–738). ACM Press.

Klapperich, H., & Hassenzahl, M. (2016). Hotzenplotz: Reconciling Automation with Experience. In *Proceedings of the Nordic Conference on Human-Computer Interaction - NordiCHI 16* (Article 39). ACM Press.

Knobel, M., Hassenzahl, M., Lamara, M., Sattler, T., Schumann, J., Eckoldt, K., & Butz, A. (2012). Clique Trip: Feeling Related in Different Cars. In *Proceedings of the 9th ACM Conference on Designing Interactive Systems - DIS 12* (pp. 29–37). ACM Press.

Laschke, M., Hassenzahl, M., & Mehnert, K. (2010). linked. – A Relatedness Experience For Boys. In *Proceedings of the 6th Nordic Conference on Human-*

- Computer Interaction – NordiCHI 10* (pp. 839-844). ACM Press.
- Law, E., Roto, V., Hassenzahl, M., Vermeeren, A., & Korte, J. (2009). Understanding, Scoping and Defining User eXperience: A Survey Approach. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems - CHI 09* (pp. 719–728). ACM Press.
- Lenz, E., Diefenbach, S., & Hassenzahl, M. (2013). Exploring Relationships Between Interaction Attributes and Experience. In *Proceedings of the 6th International Conference on Designing Pleasurable Products and Interfaces - DPPI '13* (pp. 126–135). ACM Press.
- Lenz, E., Hassenzahl, M., Adamow, W., Beedgen, P., Kohler, K., & Schneider, T. (2016). Four Stories About Feeling Close Over A Distance. In *Proceedings of the Tenth International Conference on Tangible, Embedded, and Embodied Interaction - TEI 16* (pp. 494–499). ACM Press.
- Lenz, E., Hassenzahl, M., & Diefenbach, S. (2017, in press). Aesthetic Interaction as Fit Between Interaction Attributes and Experiential Qualities. *New Ideas in Psychology*.
- Lyubomirsky, S., Sheldon, K. M., & Schkade, D. (2005). Pursuing Happiness: The Architecture of Sustainable Change. *Review of General Psychology*, 9(2), 111–131.
- Maslow, A. H. (1954). *Motivation and Personality*. Harper & Row.
- McCarthy, J., & Wright, P. (2004). *Technology as Experience*. MIT Press.
- Partala, T. (2011). Psychological Needs and Virtual Worlds: Case Second Life. *International Journal of Human Computer Studies*, 69(12), 787–800.
- Partala, T., & Kallinen, A. (2012). Understanding the Most Satisfying and Unsatisfying User Experiences: Emotions, Psychological Needs, and Context. *Interacting with Computers*, 24(1), 25–34.
- Partala, T., & Kujala, S. (2016). Exploring the Role of Ten Universal Values in Using Products and Services. *Interacting with Computers*, 28(3), 311–331.
- Pine, B. J., & Gilmore, J. H. (1999). *The Experience Economy: Work is Theatre & Every Business a Stage*. Harvard Business School Press.
- Reckwitz, A. (2002). Toward a Theory of Social Practices: A Development in Culturalist Theorizing. *European Journal of Social Theory*, 5(2), 243–263.
- Reichheld, F. F. (2003). The One Number You Need to Grow. *Harvard Business Review*, 81(12), 46–54.
- Reiss, S. (2004). Multifaceted Nature of Intrinsic Motivation: The Theory of 16 Basic Desires. *Review of General Psychology*, 8(3), 179–193.
- Schmitt, B. H. (1999). *Experiential Marketing*. Free Press.
- Schulze, G. (1992). *Die Erlebnisgesellschaft: Kulturosoziologie der Gegenwart*. Campus.
- Schwartz, S. H., & Bilsky, W. (1987). Toward a Universal Psychological Structure of Human Values. *Journal of Personality and Social Psychology*, 53(3), 550–562.
- Sheldon, K. M., Elliot, A. J., Kim, Y., & Kasser, T. (2001). What Is Satisfying About Satisfying Events? Testing 10 Candidate Psychological Needs. *Journal of Personality and Social Psychology*, 80(2), 325–339.
- van Mensvoort, K. (2017). Letter to Humanity. Retrieved April 28, 2017, from <https://www.nextnature.net/2017/04/letter-to-humanity/>
- van Schaik, P., & Ling, J. (2011). An Integrated Model of Interaction Experience for Information Retrieval in a Web-Based Encyclopaedia. *Interacting with Computers*, 23(1), 18–32.