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Design for the Value of Human Well-Being

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ABSTRACT

This chapter studies how and to what extent it is possible to design for well-being. Well-being is rarely considered in the design literature, and is rarely linked to technology and design in philosophy and the social sciences. A few approaches to design for well-being have recently materialized, however, including Emotional Design, capability approaches, positive psychology approaches, and Life-Based Design. In this chapter, the notion of well-being will first be clarified and contemporary theories of and approaches to well-being will be reviewed. Next, theoretical and methodological issues in design for well-being will be discussed that must be accounted for in any successful approach. This will be followed by a review of the abovementioned four approaches to design for well-being. The chapter will conclude by considering open issues and future work in the development of design approaches for well-being.

Keywords: well-being; design; happiness; emotional design; positive psychology

1. Introduction

Well-being, or quality of life, is often a central value in the design of technological artifacts, especially in the design of consumer products. Firms and designers often pride themselves with developing products that are claimed to enhance well-being, quality of life, the good life, or some similar notion. Given the centrality of well-being in much of design, one would expect an extensive literature on design for well-being. This turns out not to be the case. Very few studies in the design literature focus on well-being and even less present a methodology or approach for designing for well-being. The handful of approaches that has been developed, all of them quite recently, will be discussed in this paper later on.

In the philosophical literature, the situation is not much better. Philosophical studies of well-being very rarely mention technology or design. Conversely, the philosophy of technology only rarely focuses on the relation between technology and well-being. The philosophical studies that do focus on this relation rarely mention design. As a consequence, there is almost no connection between the few studies in the design literature on design and well-being, and the few works in the philosophy literature on technology and well-being.

In the philosophy of technology literature, well-being has always been an implicit topic, rarely addressed or studied explicitly, but often presupposed as an implicit value or ideal for technology and design. Already in the Enlightenment literature on science and its application, authors like Descartes, Bacon and Leibniz relate technology to well-being, mostly in positive terms. For example, 17th century philosopher

René Descartes held that the technological application of science would yield an unlimited number of devices that would allow people to effortlessly enjoy all benefits that the earth could offer them (Descartes, 1637). The optimistic vision of technology of the Enlightenment is still present in contemporary society, in which technology is frequently conceived of as an instrument of social and economic progress that makes people's lives better.

20th century philosophy of technology, in contrast, focused on negative implications of technology for well-being. It portrayed technology as destructive of the environment and of humanity, in reference to the atrocities of Auschwitz and Hiroshima. It thematized rationalization, alienation, materialism, and loss of community as implications of a technological society. It argued that technology had gone out of control, and that humanity was made subservient by it. These were themes in the early and mid 20th century, put forward by authors like Theodor Adorno, Max Horkheimer, Herbert Marcuse, and Martin Heidegger, as well as in the mid to late 20th century by authors like Jacques Ellul, Albert Borgmann, Hubert Dreyfus, Jean-François Lyotard and Jean Baudrillard. Some of these critical philophers did raise the possibility of transforming technology so as to be more supportive of well-being and other human values, for example, Ivan Illich, Langdon Winner, and Andrew Feenberg. It is only in the early 20th century, however, that philosophers have started to explicitly study the relation between well-being, technology and design (Van de Poel, 2012; Brey, Briggle and Spence, 2012).

The relation between technology, well-being and design is also rarely studied in the social and behavioral sciences. In recent decades, there has been great deal of interest in well-being in the social sciences, especially in psychology and economics, but the discussion rarely turns to the role of technology. It sometimes does so indirectly, because of a recurring focus on consumer culture, which revolves around technologically produced consumer products. Social scientists have developed mostly critical assessments of consumer culture, its products and its implications for well-being (Lebergott, 1993; Kasser and Kanner, 2004; Dittmar, 2008). Recently, social scientists have also begun to study the implications of information technologies for well-being (Amichai-Hamburger, 2009; Turkle, 2011). Rarely do these studies consider the topic of design, however.

In the following sections, I will study the very idea of design for well-being. I will begin, in the next section, by clarifying the notion of well-being and by considering theories of it and approaches to its study. I will then discuss theoretical and methodological issues in designing for well-being that must be accounted for in any successful approach. Next, I will review and critique four current approaches to design for well-being. I will conclude by considering open issues and future work in the development of design approaches for well-being.

2. What is well-being?

Well-being is a state of persons which designates that they are happy or flourishing and that their life is going well for them. Well-being is often considered to be the highest value to which other values can be subsumed: it is that what makes ones life good; a good life is for many people of the highest value. In some of the most important systems of ethics, most notably utilitarianism, well-being (or 'utility') is considered to be the highest good, and acts are to be morally evaluated according to the aggregate amount of well-being that they bring about. Well-being is sometimes equated with happiness, but not all theorists agree. Happiness, on most accounts, consists of the presence of positive feelings (and the absence of negative ones). As we will see, some philosophers have argued that well-being implies more than just having positive mental states.

Well-being has been studied by philosophers since the ancient Greeks. The philosophical study of well-being over many centuries has yielded three major types of theories of well-being: hedonist, desire-fulfillment and objective list theories (Parfit, 1986; Brey, 2012). I will now briefly discuss them in turn.

Hedonist theories hold that a well-being consists of the presence of pleasure and the absence of pain. A good life is a life in which one successfully accumulates pleasurable feelings and avoids painful ones. Although hedonist philosophies can be traced back to the ancient Greeks, contemporary hedonism finds its roots in 18th and 19th century utilitarianism. A distinction is often made between two types of hedonism. The first of these, *quantitative hedonism*, was originally proposed by Jeremy Bentham (1996 [1789]). It holds that the value of pleasure for one's life is only determined by its quantity, as measured amongst others by the duration and intensity of the feeling, and not by its quality.

Quantitative hedonism has been criticized for putting satisfaction of primitive urges at the same footing as more sophisticated pleasures, such as those resulting from friendship and art. The life of a pig is just as good as the life of a refined person, on this conception, as long as the amount of pleasure for both is the same. John Stuart Mill (1998 [1863]) argued against this position that certain types of pleasure are more desirable or worth having than others. This applies to the so-called higher pleasures, such as experiences of friendship, knowledge, art, contemplation and refinement in taste. His *qualitative hedonism* holds that a good life is not just a life with many pleasant experiences, but a life with many experiences of the so-called higher pleasures.

A problem for hedonist theories is that there seem to be qualities that make our life better which cannot be reduced to pleasure. These include the authenticity or veracity of our experiences. A life which is pleasant but which is built on illusions and deceptions would seem to be worse than a somewhat less pleasant life which is fully authentic. This problem of authenticity does not occur with *desire-fulfillment theories*, also called *preference-satisfaction theories*. Such theories hold that well-being lies in the fulfillment of one's desires. Desire-fulfillment theories emerged in the 19th century, in part as an outgrowth of welfare economics. Several versions have been proposed, from basic to more sophisticated (Crisp, 2008).

The simplest version, so-called *simple desire-satisfactionism*, holds that hold people are better off to the extent that their current desires are fulfilled. A problem with this view is that many desires of people seem to go against their long-term interests. People are often mistaken about what is good for them in the long run, and they often act on impulses that they later regret. *Informed desire-fulfillment theories* overcome this problem by claiming hold that the best life one could lead is the life in which those desires are fulfilled that one would have if one were fully informed of one's situation. If one is properly informed, the idea is, one would only desire those things that make a good fit with one's character and that one is likely to be able to realize.

Objective list theories of well-being hold that well-being is the result of a number of objective conditions of persons and do not rest on a person's subjective preferences or experiences. There are objective goods that contribute to a person's well-being even if that person does not desire them or experiences pleasure from them. Well-being is attained when one has attained most or all goods on the list. Goods that are often put forward in objective list accounts include liberty, friendship, autonomy, accomplishment, wisdom, understanding, morality, the development of one's abilities, enjoyment, and aesthetic experience (Parfit, 1986; Griffin, 1986). One influential type of objective list account, *perfectionism*, holds that what is good for us is given by our intrinsic nature as human beings, and that we

should strive to excel so as to realize these goods. The most famous perfectionist theory is Aristotle's theory of *eudaimonia* or flourishing.

The second half of the 20th century has seen the emergence of theories of well-being in the fields of economics and psychology (Brey, 2012). Most of these theories can be placed within the categories that have been distinguished in philosophy. In psychology, a true *psychology of happiness* started to emerge in the 1980s, due in part to the seminal work of Ed Diener, who strived to make well-being a measurable quantity that could be studied empirically (Diener, 1984). Since Diener, psychologists tend to focus on *subjective well-being*, which is how people evaluate their own happiness, something that can be recorded and measured. They also use the term *life satisfaction*, which denotes how people assess the balance between positive and negative affect and success and failure in their lives as a whole, and which is to be contrasted with assessments of subjective well-being which denote people's happiness at a certain point in time (Diener and Lucas, 1999). The 1990s subsequently saw the emergence of *positive psychology* (Seligman and Csikszentmihalyi, 2000), an approach within the psychology of happiness that has become dominant. Positive psychology does not merely aim to study well-being, but also to develop psychological techniques and tools for making people's lives more fulfilling.

In economics, happiness and well-being have been important topics since 19th century neoclassical economics, which explains economic activity in terms of its expected utility (which is often equated with well-being), and 20th century welfare economics, which aims to measure social welfare and improve it through economic solutions that maximize utility. An important approach within contemporary welfare economics, which has been taken up in philosophy as well, is the *capability approach* (Sen, 1980). This approach assumes that people's ability to attain well-being depends on their possession of a number of basic capabilities, the development of which can be supported through social and economic means. It will be discussed more extensively in section 4. Recent decades have seen the emergence of *happiness economics*, a new branch of economics that studies the economic conditions for happiness and well-being and that relies strongly on psychological research on happiness (Bruni and Porta, 2005).

3. What does it mean to design for well-being?

In this section, several theoretical and methodological issues will be discussed regarding design for well-being. The first issue is whether technological artifacts are capable of promoting or enhancing well-being, and whether it is possible to design for well-being. Having answered these two questions positively, we will then move on to the question of how different conceptions of well-being, as discussed in section 2, can be related to technological designs. Next, we will discuss the epistemological problem of how designers are to know what conception of well-being they should design for and how to find this out by studying users and stakeholders. We will then consider the scope problem, which concerns the question how to delineate both the people whose well-being will be considered and the possible effects on well-being that will be considered. The aggregation problem will be next, which concerns the question of how multiple and possibly conflicting well-being values can be accounted for in a single design. Finally, we will consider the specification problem, which is how to derive specifications for designs that promote well-being.

The first issue we will consider is whether design for well-being is actually possible. Several approaches in ethics of technology hold that this is. They hold that the use of technological artifacts can

often be reliably correlated with consequences or effects beyond the intended function of the artifact. Some of these consequences will be desirable, whereas others will not be. It may be possible to design artifacts in such a way that a certain desired consequence is bolstered or an undesirable consequence is avoided. Increased well-being is a possible consequence of the use of a technological artifact. Therefore, it is possible, in principle, to design for well-being.

The most notable approach in ethics of technology that holds this position is the approach of value-sensitive design (Friedman, Kahn and Borning, 2006; Brey, 2010) or VSD. The VSD approach explicitly takes values into account in design and aims to arrive at designs that adhere to, or promote, these values. Well-being is recognizable as a value: it is an abstract ideal that is part of our conception of the good. In VSD approaches, well-being is recognized as an important value that can be incorporated into designs. Within the VSD approach, to say that an artifact embodies a value such as well-being is not to say that the artifact will deterministically bring about well-being, however and by whomever it is used. Rather, it is to say that given a particular user or range of users, and in a particular context or range of contexts, the use of the artifact will tend to promote well-being. Given one's knowledge of user and context of use, it is therefore possible to design for well-being.

Design for well-being means different things for different conceptions of well-being, as discussed in section 2. On a hedonist conception, design for well-being is design for pleasurable experiences or for the prevention or lessening of negative ones. By this criterion, the focus will be on designing artifacts that cause pleasant sensations, enable users to undertake activities that are pleasurable, allow the user to avoid unpleasant activities, and prevent or reduce mental and physical pain and discomfort. On a desire-fulfillment conception, design focuses on satisfying desires of users and other stakeholders. Within a simple desire-fulfillment approach, this would require investigations into what people desire and then creating designs to help these desires come true (and that avoids side-effects that are not found desirable). Design is more difficult within an informed desire-fulfillment approach, since it requires determination of the hypothetical desires that people would have if they were properly informed, which is a more speculative endeavor. On an objective list conception, finally, designs should be such that they help bring about the acquisition of goods on the objective list. For example, they should support the development and maintenance or exercise of friendships, autonomy, and practical wisdom.

Having claimed that design for well-being is possible, I will now turn to several problems that a design approach for well-being must overcome. The first of these is the *epistemological problem* (Van de Poel, 2012). This problem is how designers are to know which conception of well-being applies to a particular user or stakeholder. On most conceptions of well-being, what is well-being for a particular person cannot be determined objectively, through objective criteria independently from that person. It requires an understanding of that person, which may include knowledge of his or her preferences, desires, values, traits, and social and cultural embeddedness. In the absence of this knowledge, designers need to know what constitutes well-being for the expected user(s) of the design. Design for well-being may therefore require studies of users, such as questionnaires, tests or experiments to reveal their preferences, values, or other traits. But how is this to be done?

Another problem in designing for well-being is what I call the *scope problem*: what range of stakeholders and potential consequences for well-being will be considered in the design? One issue here is the extent to which indirect effects on well-being are considered. A video game may have immediate positive effects on well-being, such as feelings of joy and excitement. But it may also have indirect negative

effects, such as social isolation, sleep disturbances, and strain to arms and neck. It would seem that consideration of such indirect effects should be included in the equation in design for well-being. However, indirect effects are often more difficult to determine and more contingent on other factors. It therefore needs to be considered to which extent indirect effects will be considered.

Another scope issue is whether design for well-being should focus on users (user well-being) or also on other stakeholders (stakeholder well-being). From an ethical point of view, taking into account the well-being of all stakeholders seems preferable over just accounting for user well-being, although Van de Poel (2012) argues that designers normally do not have a moral imperative to account for stakeholder well-being. A final scope issue concerns the distinction between subjective well-being and life satisfaction that was made in section 2. The effect of using an artifact on well-being may be measured by focusing on relatively immediate positive and negative experiences of users. Another measure is to consider how using the artifact over time may change people's assessments of the quality of their lives as a whole. This will be more difficult to measure, but will ultimately be more important than immediate effects on subjective well-being.

Next, the *aggregation problem* is described by Van de Poel (2012) as the problem of how the well-being of different people can be aggregated into an overall measure of well-being. The aggregation problem exists because different people will often have different and possibly even conflicting or incommensurable conceptions of well-being, and this raises the question of how different well-being values of different stakeholders can be added up and combined into one measure of well-being and one design. This problem applies to cases of design for the well-being of stakeholders beyond the user, and also to cases in which artifacts may be used by multiple users with different well-being values. Not recognized by Van de Poel, it may also emerge in accounting for the well-being values of a single user, which may be conflicting and incommensurable as well.

Finally, there is the *specification problem*, which is how to go from well-being values to design specifications. Such design specifications define design features (structural features, capabilities, affordances) that tend to correlate with positive effects on well-being when the artifact is used by a particular class of users in a particular class of contexts. These design features have a causal role, together with other causes in the context of use, in bringing about states of well-being. For example, textural smoothness in a hand-held device may bring about pleasant feelings that may be absent in a device without this feature. Although there are probably rules of thumb for relating well-being values to design features, determining such features is likely to be part of the creative process in design.

4. Four design approaches

Design for well-being has only quite recently become a subject that designers, philosophers and social scientists have started paying attention to. Little work still exists in this new area, and the approaches that have been developed are still young. In what follows, I will present and discuss four distinct approaches that have recently been put forward.

4.1 Emotional Design

Emotional Design is the name for a family of approaches that use design to evoke emotional experiences in users. It focuses on emotional experiences of users with products and emotional meanings associated with product use. The aim of Emotional Design is to provide products with additional utility by designing them to evoke pleasure and other positive emotions in users. The term "Emotional Design" was coined by Donald Norman in 2005.

Patrick Jordan was one of the first designers to focus on positive emotions in design in an approach that he called *pleasure design*. Jordan (2000) claims that designers should not just design for functionality and usability, but also for pleasure: products should be pleasurable to use. He distinguishes four types of pleasure which he claims motivate humans to use products. Although he claims that pleasurability is not a property of a product but the result of the interaction of users with a product, he claims that designers could design affordances in product that would make them pleasurable to use for most users. He therefore associates the four pleasures with distinct design features.

Jordan distinguishes the following four pleasures and associated design features:

- *Physio-pleasure:* Bodily pleasure deriving from the sense organs (touch, taste, smell, appearance and sound). Associated design features: pleasurable sensory features.

- *Psycho-pleasure:* Pleasure deriving from cognitive and emotional reactions. Associated design features: usability.

- *Socio-pleasure:* Pleasure arising from one's relationship with other people or society as a whole. Associated design features: markers of social or cultural status, features that express social messages.

- *Ideo-pleasure:* Pleasure arising from people's values and tastes: cultural and aesthetic values, moral values and personal aspirations. Associated design features: material or semiotic features that express values like sustainability, sobriety, artistic values, religious values, etc.

According to Jordan, then, designers can enhance the well-being of users by equipping products with design features that enable pleasurable feelings of these four kinds.

In his 2005 book *Emotional Design*, design guru Donald Norman introduces Emotional Design as an approach that takes into account the emotional response of users to products and that strives for products to evoke positive feelings. Norman's focus is on positive emotions, which resemble Jordan's pleasures, but possibly denote a broader range of feelings. Normal claims that users experience emotions in products at three levels, each of which can be accommodated for by different design features:

- *Visceral level:* At this level, people have rapid responses to products, making rapid judgments regarding goodness, badness, safety and danger. Visceral responses are biologically determined, and involve signals to the muscles and to the rest of the brain. They constitute the start of affective processing. Associated design features: general appearance.

- *Behavioral level:* This is the level at which people experience the use of products. At this level, people are not concerned with appearance, but with the usability and effectiveness of the product.

Relevant components at the behavioral level are function, understandability, usability and physical feel. Associated design features: functional properties, usability, tactile features.

- *Reflective level:* This level is the least immediate. It is the level at which the product is attributed a meaning beyond its appearance and use. At this level, products and their use evoke meaning, culture, self-image, personal remembrances, and messages to others. Associated design features: material and semiotic features that express such meanings.

In Norman's approach, therefore, well-being is enhanced by designing products so that they evoke positive emotions associated with appearance, use and their broader personal, social, and cultural significance.

A third author that deserves mention in the context of Emotional Design approaches is psychologist Mihalyi Csikszentmihalyi, whose 1990 book *Flow* has had a major influence on product design. Csikszentmihalyi claims that when people engage in activity, they may reach a state of flow, which is an emotional state between boredom and anxiety. Flow is a feeling of complete and energized focus in an activity, with a high level of enjoyment and fulfillment. In flow, there is a good balance between challenge and skill, so that the task at hand is neither too challenging nor not challenging enough, and someone's skills are experienced as making a good fit with the task at hand. This provides one with a feeling of flow. Flow is a positive emotion that has become sought after in interaction design. Designers that aim to incorporate flow in their designs aim for an adequate balance between challenge and skill for intended user groups. Flow has been used as a design criterion for computer interfaces, web sites and computer games, amongst others (King, 2003; Chen, 2007).

Emotional Design approaches constitute a strong attempt to go beyond mere functionality of products to consider positive feelings in product design. While such positive feelings may enhance well-being, it would go too far to consider these approaches as constituting a comprehensive design approach for well-being. Emotional Design focuses on positive feelings that are evoked by artifacts while they are used or perceived. There is little or no attention to consequences for well-being beyond these immediate experiences. These include indirect pleasurable feelings that indirectly result from the use or possession of a product and more lasting effects on life satisfaction. Therefore, Emotional Design approaches are at best only a component of a comprehensive approach to design for well-being, and not a comprehensive approach in itself.

4.2 Capability approaches to design

Capability approaches to design (Oosterlaken, 2009; Johnstone, 2012; Oosterlaken and van den Hoven, 2012) take an approach that is very different from Emotional Design. Rather than focusing on the arousal of positive feelings, they focus on the enhancement of people's basic capabilities for leading a good life. The foundation for this approach is found in the capability approach, an approach to well-being and welfare that rests on the assumption that people's ability to attain well-being is dependent on their development and possession of a number of basic capabilities that allow them to engage in activities that promote their well-being. The capability approach has originally been developed by economist Amartya Sen (1980) as an approach to welfare economics, and has been further developed in philosophy by Martha Nussbaum, one of Sen's collaborators (Nussbaum, 2000).

The capability approach assumes that well-being is possibly the most important condition for people to strive for, and that every person should have the freedom to achieve well-being. It then goes on to claim that in order to attain a state of well-being, people must be in possessing of a set of basic capabilities, which are opportunities to do things or be things that are of value to them. The exact set of capabilities may vary from person to person, since people may have different conceptions of value that require different sets of capabilities for their realization. However, Martha Nussbaum (2000) has argued that people tend to be in agreement on a basic set of ten capabilities. These include capabilities to life, bodily health, emotions, practical reason, play, affiliation, control over one's environment, and others. Being in possession of a basic set of capabilities is no guarantee for well-being; these capabilities must also be exercised in order to realize the actions or states of being that the capabilities are directed at. But they are necessary conditions for well-being, since people without them cannot attain well-being.

The relevance of this approach to design is as follows. Technological artifacts can strengthen and extend human capabilities. For example, technological products can help people find, prepare or consume foods, help them exercise, or help them protect from or heal from injuries or disease, thereby helping them stay alive and maintain bodily health. Or, in relation to Nussbaum's emphasis on play as a component of well-being, technological products can help people play and enjoy recreational activities. Design for well-being, according to the capability approach, is therefore designing products that enhance basic capabilities for well-being.

Capability approaches to design therefore tend to emphasize functionality, rather than other design features. They direct this functionality towards the enhancement of basic capabilities for a good life, rather than to other functionalities that cannot clearly be related to the capabilities needed for leading a good life. Capability approaches prescribe that products should generally be designed to enhance one or more basic capabilities, and to avoid harm to other capabilities. The enhancement of basic capabilities can either be found in the proper function of an artifact or in secondary functionalities or features.

Capability approaches have the advantage over Emotional Design approaches that they can better account for indirect and lasting effects of product use for well-being. In fact, they have little concern for the fleeting feelings of pleasure that Emotional Design approaches focus on. Instead, they focus on building and expanding durable capabilities that are core requisites for lasting well-being.

In spite of this advantage of capability approaches to design, there are also significant weaknesses to them. First, there is considerable disagreement amongst proponents of the capability approach whether it is possible to draw up a list of basic capabilities that applies to most or all people, and if so, what this list should look like. Even if there were to be agreement on a particular list, the capabilities may be so abstract that they do not offer sufficient guidance for design. One reason is that it may be unclear whether there a design makes a net positive contribution to a capability. Do mobile phones, for example, contribute to better affiliations with others? It depends on what one takes as the default situation against which they are measured. Another reason is that it may be unclear whether a positive contribution of a design to a capability outweighs a negative contribution to a different one. For example, a motorized bicycle (as compared to an unmotorized one) may give one more control over one's environment by increasing one's mobility, but may also negatively affect one's physical health by reducing one's exercise. How is one to determine whether the design makes a net positive contribution to well-being?

Overall, capability approaches to design seem promising, but the guidance to actual design practices has so far been limited because of the abstract, unoperationalized nature of existing approaches. Perhaps there is also a more fundamental issue here: capabilities are decontextualized phenomena, and because of this, capability approaches seem to have difficulties taking into account the context in which capabilities are used and the particular values and characteristics of the persons that have them. In addition, capability approaches seem to ignore consequences of the use of artifacts for well-being that are not mediated by capabilities. For example, using an artifact may evoke feelings of pleasure or contentment that do not involve the augmentation of a particular capability, but that nevertheless contribute to well-being.

4.3 Positive psychology approaches

Positive psychology is an approach within psychology that focuses on studying and improving people's positive functioning and well-being (Seligman and Csikszentmihalyi, 2000). Positive psychology has recently emerged as the dominant psychological approach to well-being. It stands apart from many other psychological approaches by focusing on the enhancement of creativity, talent and fulfillment, rather than on treatment of mental illness.

A very influential theory in positive psychology is Martin Seligman's theory of authentic happiness (Seligman, 2002). Seligman holds that a good life is a combination of three types of lives: the pleasant life, the engaged life and the meaningful life. The pleasant life is attained by having, and learning to have, positive feelings, that are directed at the present, past and future. The engaged life consists in the pursuit of engagement and involvement in work, intimate relations and leisure. Engaged activity brings experiences of flow (Csikszentmihalyi, 1990) in which one's attention is completely focused and time loses meaning. The pursuit of engaging activities requires character strengths and virtues ("signature strengths") that allow one to execute activities in an engaged manner. The meaningful life, finally, is a life in which one's signature strengths and talents are used in the service of things that one believes to be bigger than oneself.

Although not much work has yet been done to apply positive psychology to design, an interesting approach has been developed by Ruitenberg and Desmet (2012). They want to use positive psychology to design products and services that promote happiness or well-being. They focus on long-term life satisfaction rather than short-term experiences or emotions in using products. As they explain, they want to make a shift from product experience (the focus of Emotional Design approaches) to *meaningful activities*. Meaningful activities are activities that use and develop personal skills and talents of the users, that are rooted in core values of the user, that contribute to a greater good (a thing or person), and that are rewarding and enjoyable in themselves.

Ruitenberg and Desmet want to design products that enable and inspire people to engage in meaningful activities, define as above, that contribute to happiness and life satisfaction. Design includes visualising meaningful activities and then designing products that enable or inspire people to engage in these activities. They recognize product-oriented design strategies, as found in Emotional Design approaches, as part of their approach. As they state, pleasurable experiences associated with product use can contribute to overall happiness. However their major focus is on meaningful activities that are enabled or suggested by products and that either contribute to happiness or take away sources of unhappiness. As an example of a product that stimulates meaningful activities they describe a "vegetable book," a large book placed on a stand in a communal vegetable garden with a page for each vegetable which allows users to place notes on how to

grow or cook the vegetable. This product enables and stimulates sharing activities between gardeners that contribute to overall happiness.

Their approach is aimed at inducing behavioral change by stimulating voluntary changes in our daily actions. Our daily routines should become tied to proven strategies for increasing happiness such as 'cultivating optimism,' 'nurturing relationships,' 'taking care of your body,' and 'practicing acts of kindness.' Products should be designed to support behavioral changes towards such strategies. This is not easy, and requires that people are already receptive and motivated to change their routines, know how to do it, and are triggered in some way to do it. Ruitenberg and Desmet believe that good designs can provide the necessary triggers and can support people in being motivated and enabled to make behavioral changes.[1]

The positive psychology approach of Ruitenberg and Desmet has as strong points that it focuses on long-term life satisfaction while also incorporating the temporary positive experiences sought in Emotional Design, and that they aim to develop explicit design strategies for triggering behavioral changes in persons towards more wholesome routines. The approach is still in its early stages, however. The design methodology and the conceptual framework for identifying dimensions of well-being that can be incorporated into meaningful activities are still underdeveloped. Perhaps these limitations can be overcome in the future. A potentially more fundamental criticism is that this approach focuses on relatively isolated behavioral routines, and does not consider the whole lives in which these routines are supposed to function and to contribute to an overall ideal of well-being. The next design approach that will be discussed does have whole lives as its focus in design.

4.4 Life-Based Design

Life-Based Design (Leikas, 2009; Saariluoma and Leikas, 2010; Leikas et al., 2013) is a design approach that aims to improve well-being by looking at people's whole lives and the role of technologies in them. Looking at whole lives involves studying people's forms of life, values, and circumstances, and taking these into account in design. The notion of a *form of life*, originally proposed by Ludwig Wittgenstein, is key to the approach. A form of life is a practice or "system of rule-following actions", such as a hobby, activity, profession or family role. Examples are "motor cycling," "being a soccer fan", "being a grandparent," "being a medical doctor" and "living in a senior home".

There are four phases in Life-Based Design (Leikas et al., 2013):

(1) *Form of Life Analysis*. In this phase, a particular form of life is described, including the rule-following actions and practices that are typical to it, the values that people share in the form of life, and typical actors, contexts and actions, and explanations of their connectedness. Problematic issues in the form of life are also identified, and design goals are formulated, ultimately resulting in a set of human requirements which define in general terms how people's lives in a specific form of life should be improved.

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[1] Desmet and Pohlmeyer (2013) develop a similar approach within positive psychology which they call *positive design*. Positive design aims to design for pleasure (personal affect), personal significance (pursuing personal goals) and virtue (being a morally good person). All three should be strived for in each design. Such designs are then held to enhance overall well-being.

(2) *Concept Design and Design Requirements*. In this phase, a more precise definition of the problem to be solved is developed and it is conceived how this problem may be solved through a technological design. It states how a technology may achieve action goals that are believed to make the user's life better, and ends up with a technical design and implementation. After this phase, it is clear what the technology looks like and how people will use it in their lives.

(3) *Fit-For-Life Design.* In this phase, it is investigating, in interaction with users, if the proposed design ideas does really their quality of life, and if the technological solution to do so is optimal. This is an iterative process that may lead to repeated improvements in the technology.

(4) *Innovation Design.* In this final phase, procedures are developed and implemented for incorporating the new technology into real-life settings and making it ready for general use. This includes accounts of the social and technical infrastructure for the technology, development of a marketing plan, and further needed auxiliary activity.

Life-Based Design has several strong features compared to the other three approaches that have been discussed. It takes a more integral and more contextualized approach than Emotional Design and Capability approaches. Compared to Positive Psychology approaches, it has a somewhat broader focus as well, focusing on forms of life rather than the often more specific behavioral routines that are the focus of Positive Psychology approaches. Life-Based Design is still novel, however; its methodology needs to be developed more and few case studies have been developed to apply the theory. It currently lacks a conceptual framework for identifying well-being values that are at stake in the forms of life it studies. A potential weakness is that its focus is on improving existing forms of life, and does not seem to include the possibility of developing new forms of life. It is in this way complementary to the Positive Psychology approach that was discussed, which aims to develop brand new behavioral routines.

5. Conclusion: Open issues and future work

Design for well-being is still in its infancy. Only recently, since the year 2000, a handful approaches has emerged, and these are still limited in scope, they require further methodological development, and they have not yet been developed extensively using case studies. Our discussion has indicated that design for well-being is possible, but must deal with complex issues that have not yet been adequately resolved, which include the scope problem, the epistemological problem, the aggregation problem and the specification problem. The design approaches that were reviewed recognize and engage these problems to a limited extent only.

Of the four approaches that we discussed, Emotional Design is well-developed but is the most limited in scope, focusing mostly on product experience. Capability approaches are complementary to Emotional Design approaches in their focus on capability building, but it is often unclear what the relevant capabilities are for design, and the approach is rather decontextualized. The positive psychology approach has as its strong point that it stimulates new meaningful practices. Life-Based Design is the most comprehensive existing approach, but is conservative in aiming to improve existing forms of life only. There seems to be a complementarity in the four approaches, in that they emphasize different factors in well-being: product experience for Emotional Design, capability building for capability approaches, stimulating new meaningful practices for the positive psychology approach and improving existing practices

for Life-Based Design. Perhaps, then, a combination of these four approaches is needed for a fully comprehensive design approach for well-being.

Any design approach should solve the epistemological problem of identification of relevant well-being values for particular users or user groups. I believe that this problem can be solved in two steps. The first step is the development of a list of well-being values for humanity as a whole. Such a list could be based on broad surveys combined with conceptual analysis, and would yield a list of well-being values that hold for at least some groups in society, with adequate descriptions and operationalizations. This list will possibly contain items such as autonomy, deep personal relationships, engagement, play and achievement. A second step is to do empirical investigations of particular users or user groups which of these well-being values apply to them (in a particular context, or in relation to a particular problem). There are standard empirical protocols to do this in the field of happiness psychology. Current design approaches make little use of the extensive research approaches that have been developed in happiness psychology and related fields, and design practices are likely to improve if they start doing so. The result of this second step is an understanding of the well-being values that apply to particular users in particular contexts, which is needed to solve the epistemological problem.

Similar progress can also be made on the scope problem. Ideally, from the point of view of optimizing well-being for society as a whole, design would focus on stakeholder well-being and on life satisfaction, rather than users only and transient positive experiences only, and it would consider indirect effects on well-being as well as direct ones. For practical purposes, it may often be necessary to opt for a more limited scope. Research is needed to determine what scope should be chosen in particular situations from a standpoint of feasibility and cost-effectiveness.

The aggregation problem may be approached in one of two ways. When it occurs because of value pluralism within users, it can be avoided by making artifacts configurable for different user groups in a way that reflects their values, or by designing different versions of an artifact for different user groups. A second way to deal with the problem is to develop a framework for resolving conflict and incommensurability between different well-being values. For individual users, this may perhaps be achieved by asking them to give weight to different well-being values and rank them in relation to each other. For groups of users, the same can be done, but in addition procedures must be developed for resolving conflicts of interest between their members. This could be done through ethical analysis or democratic decision-making processes.

As I argued earlier, the specification problem can never be fully solved, because design is a creative process that cannot be fully captured in rules. But it may be possible to develop a set of design principles that specify, for different well-being values, which kinds of design solutions may work for them. For example, the Emotional Design approach suggests that it may be possible to list materials, shapes, colors, textures and so on, that typically evoke positive feelings, or that do so contingent to further characteristics of the user and the context of use. Similarly, there may be design principles that specify what type of communication a communication technology must support in order to support friendships, or which types of information processing do or do not support autonomy by supporting autonomous choices. Further development of methods of design for well-being may result in a large arsenal of design principles that help designers go from well-being values to design specifications.

Technology plays a powerful role in our lives and is a key factor in well-being. Well-being is one of our highest values, a value that subsumes many others. Developing approaches to design for well-being

should therefore be a major goal in design. Design for well-being is feasible, but much progress is still to be made in developing approaches for it. I have reviewed current approaches and have indicated how progress can be made towards the development of sophisticated, comprehensive and effective approaches to design for well-being.

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