

FROM USE TO PRESENCE ON THE EXPRESSIONS AND AESTHETICS OF EVERYDAY COMPUTATIONAL THINGS

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Abstract

Information technology is rapidly changing from being tools for the researcher or the business professional to becoming part of the building blocks we use to construct our everyday lives. With the coming ubiquity of computational things we have to consider what it means to design computational artefacts that eventually become a natural part of people's everyday life. We argue that this development urges us to consider what it means for something to be *present* in someone's life, in contrast to being just used for something.

"Use" and "presence" represents two perspectives on what a thing is. While "use" refers to a general description of a thing in terms of what it is used for, "presence" refers to existential definitions of a thing based on how we invite and accept it as a part of our lifeworld. If we ask for the use of a chair, we ask for the purpose with having a chair, what we use chairs for, etc. If we instead ask about the presence of a particular chair in someone's living room, we are not interested in what chairs in general, or even this particular chair, can be used for, but in the role and meaningfulness of this particular chair as present in this person's life.

Searching for a basis on which these existential definitions are formed, we argue that the *expressions* of things are central for accepting them as present in our lives. This places aesthetics in the centre of design. Aesthetics is not about the creative or artistic surface of these everyday computational artefacts, but about how their expressions form an identity that can make them meaningful building blocks in someone's lifeworld. We argue that aesthetics, as a logic of expressions, can provide a proper foundation for design for presence. We go on to discuss the expressiveness of computational things as depending both on time structures and space structures. Finally, an aesthetical leitmotif for the design of computational things –a leitmotif that may be used to guide a normative design philosophy, or a design style– is described.

Keywords: Ubiquitous computing, information appliances, design, aesthetics, phenomenology

1 Introduction

Over the next twenty years computers will inhabit the most trivial things: clotheslabels (to track washing), coffee cups (to alert cleaning staff to moldy cups), lightswitches (to save energy if no one is in the room), and pencils (to digitize everything we draw). In such a world, we must dwell with computers, not just interact with them. *Weiser* [31, p. 3]

The aesthetic potential of the narrative space centred on the consumer product has received surprisingly little attention from artists and writers and even less from designers. Few films or stories acknowledge how our lives and identities are intertwined with machines and artefacts, particularly everyday electronic products. Though we inhabit an environment of electronic gadgets and gizmos, little effort is turned towards exploring what this means. *Dunne* [5, p. 62]

Information technology is changing from only being tools for the researcher or the business professional to becoming part of our everyday lives. Part of this change is due to the rapid development of inexpensive embedded, wearable and mobile computing systems and the continuous miniaturization of components that allow us to create a vast range of novel computational artefacts at a reasonable cost. This technological development and its implications for how we both think about and design human-computer interaction have been the starting point for several lines of research in recent years such as ubiquitous computing [30, 32], tangible media [15] and augmented reality [34].

Here, we will take a step back and discuss some of the implications of this development. Our discussion will be centred on a perspective of increasing importance in technology development, namely *phenomenology* [cf. 27, 35]. We argue that the coming ubiquity of computational artefacts drives a shift from efficient *use* to meaningful *presence* of information technology. Our interpretation of this shift from use to presence comes mainly from working with various forms of novel human-computer interfaces [cf. 24, 25]. Having encountered problems such as how to evaluate a certain design, and describe what constitutes good design in these areas, we came to question the relevance of some of the basic assumptions in human-computer interaction. In what follows, we will try to discuss some of the problems that, to us, suggested that we might have to change perspectives when designing and evaluating everyday computational things.

The design and evaluation of an artefact are always done in relation to a definition of what the artefact is; what it is that we aim to design. In human-computer interaction, we usually think of the computer as a tool for achieving certain ends, such as creating a document or searching for information. We thus evaluate the usability of computational artefacts in relation to criteria such as efficiency, simplicity of use, and ease of learning, based on a relatively precise description of what they are used for. We may call descriptions of things along these lines *functional* descriptions based on a general notion of *use*. This is what we do when we ask what a house, or a hammer, is and answers

with a description telling what houses and hammers in general are used for. These are descriptions of artefacts focused on the general objectives of use without any reference to a specific person that uses them in some specific situation.

We can also answer the question of what a thing is in a different way, as when we ask a friend about a certain piece of furniture in her home and she answers that it is the table she got from her late grand father. Clearly, it would be inappropriate to answer such a question with that it is a piece of furniture on which you can put this or that kind of object provided it does not weigh more than X kg. When we ask questions about this particular table, we do not ask for its general use, but about its existence in our friend's life, e.g., its role or place. When we learn what it is, we get an *existential* description of what this particular table is to our friend, a description based on the table's *presence* in her life. Unlike a description based on a general notion of use, this definition in terms of presence is related to a particular meaning given to a specific unique thing.

The notion of presence that concerns us here is not the mere physical existence of things in someone's surroundings, but rather the existence of things in our everyday life based on an act of acceptance; we give certain things a place in our lives as we turn to them and let them enter our life [cf. 3]. The presence of a certain phone means that it exists as someone's phone or the phone at someone's office or home, with a specific meaning as such. Thus, presence concerns the existence of things based on an existential definition of what they are.

Currently, human-computer interaction is dominated by references to functional descriptions of artefacts based on general notions of use, while references to existential descriptions based on presence is almost completely neglected. However, increased physical presence of computers in various environments, frequently governed by the notion of the invisible or disappearing computer, is gaining a growing interest in sub-fields of human-computer interaction such as ubiquitous computing. Frequently, computers becoming an integrated

part of everyday life is taken to be something equal to embedding computational technology in various artefacts or in the walls of a building.

Clearly, this is not what was referred to as being “present” in someone’s life as described above. Even if we expand our notion of use and usability in interaction design to include new forms of interaction such as automatic sensing of user activities and context-aware applications, this is still a matter of “use” in the sense described above. If we want to understand what it means for an artefact to be part of someone’s everyday life –and eventually to design for this– we have to consider its presence beyond just being physically there.

The two different perspectives on artefacts here represented by the notions of use and presence, have very different implications when it comes to design and evaluation of artefacts. When computer systems change from being tools for specific use to everyday things present in our lives we have to change focus from design for *efficient* use to design for *meaningful* presence. What does this shift of focus really mean? What is the meaning of “usability” with respect to this change? What could be a proper foundation for the design and evaluation of computational things with respect to presence? In what sense does the meaning of interaction design change as we shift our focus from use to presence?

2 Presence

Information technology in the form of devices such as mobile phones, personal digital assistants (PDAs), personal computers, and information appliances, is increasingly used in everyday life. As information technology pervades everyday life, computational artefacts also become a part of our lives: we can say that we let some of

these artefacts enter our *lifeworld*. As we take them for granted in our lifeworlds, they often become something more than just tools to be used to accomplish given tasks.

Consider for instance the following observation made by designers of Nokia phones:

the mobile phone was first considered to be a serious tool for certain occupations, especially the military, and then an item for business purposes. After a while –around the early 1990s– it became a consumer product in countries like Finland, Sweden, and the UK. In this adaptation to consumers' lifestyles, the personalization of the mobile phone may play an important role: In constant use the mobile handset becomes a very personal object that intensifies the user's feeling of being inseparable from it." [29, p. 173].

That a phone becomes a personal object and not just a tool for communication suggest that this phone has become a part of someone's life; my phone will not just be any phone, but a unique thing that belongs to my lifeworld, just as my house is not just any house but this particular house of mine.

To say that a thing is part of our life is to say that there is proper place for it in our lifeworld, it becomes a part of our life through a process where we find or define a place for it. Many kinds of artefacts have well-defined places, or categories of places, that they are more or less designed to fit. We can also design with such places in mind, as when we create furniture for a kitchen or a living room. While kitchens and living rooms are physical places, furniture designed for these places also indicate ways for these things to enter into our everyday life.

Personal computers were designed to fit into an office environment and the activities taking place there. They were designed to be efficient tools in the hands of the professional – a role we are beginning to understand as our knowledge about usability and user interface design matures. Thus, our present practice of interaction design is

directed to this setting. Obviously, everyday life is quite different from office work and therefore other “places”, interfaces and appearances have to be explored in order to find a broader repertoire of strategies for creating human-centred technology.

The perhaps most influential example of an alternative scenario for human-computer interaction is *ubiquitous computing*, as described by Weiser and his colleagues at PARC some ten years ago [32]. Their main intention was to replace the personal computer and move the interaction with digital information out into the rich physical space we inhabit. Other approaches that address similar issues on how to integrate computational resources with the physical world and make the combination something meaningful, usable and enjoyable to live, work and play in, include *augmented reality* [34], *tangible user interfaces* [15] and *ambient media* [36].

Originally, the ubiquitous computing experiment used computer displays, in the sizes of boards, pads and tabs [30]. These displays all used graphical user interfaces and were quite similar to ordinary computer displays. Later in the development of ubiquitous computing, however, more radically different forms of information displays and interfaces were introduced. One new approach was the notion of *calm technology* [33]. Calm technology can, for instance, be technology that continuously presents information to us in the same non-obtrusive way as for instance an inner office window is a way of obtaining information about the activities outside. A central idea is the notion of an interface that moves between the foreground and the background of our attention [33]. This has also been one of the main ideas behind the design of ambient information displays [36]. Clearly, many of these new experiments are not concerned with new functionality; rather they are explorations of new forms of appearances of computers and of how we can design their presence in everyday life by means of placement, interaction design, context-aware and/or embedded technology, etc.

Often, the goal of these experiments is to make the computer “disappear”. While making the computer literally invisible might be a step in the right direction, disappearance in the phenomenological sense is more complex. Invisible things are the ones taken for granted: we do not focus our attention on the hammer itself when we use it – we just use it. The hammer is not invisible, but it “disappears” as it is just a natural part of us, something that we do not attend to or reflect upon, as we nail something. Similarly I do not consciously use my feet to walk – I just walk. In fact, most things present we take for granted as natural parts of our life. If the door to my house suddenly is gone as I am about to leave for work in the morning, the absence of the door in a very explicit manner forces me to reflect upon something that I have taken for granted. When I install a new door, I will gradually accept this new thing as the door to my house and after a while this thing too will become a natural part of my life that I do not attend to or reflect upon.

In this manner, things appear and disappear as parts of our everyday lives. Most of the time the things present in our lives will just be there without us attending to their presence. But presence of things presupposes a process of acceptance. Things appear and we open or close the door to our lifeworld for them. To build a sound foundation for design, we have to understand these acts of acceptance with respect to some reasonable, and clear enough, understanding of the notion of what of everyday computational things are.

3 Design for Presence

Design is in a certain sense a question of instantiation: to design is always to design something that is given, e.g., a “chair”, a “mobile phone”, etc. Correspondingly, we evaluate the result according to a description or a definition of what that something given is. When we design for use, this means for example that the design and evaluation

of a thing is done on the basis of some definition of what such a thing is and what it is used for. If we instead want to design and evaluate a design with regards to presence of designed things in our everyday life we are faced with the problem of relating design and evaluation to existential definitions of things, e.g., to their particular existence in someone's lifeworld. What does this mean in practice?

The intended object of a design act determines a collection of design variables describing what we intend to design and also roughly how. The design process is in an abstract sense the process of making these variables explicit and form concrete instances of them. An abstract form is implicitly given by the choice of variables, and the instantiations of these variables carry with them the specific material form. If it is about designing a chair we may think of variables like the legs, the arms, the back and the seat of a chair. Now, forming a concrete instance of a back of a chair of course also involves design. Thus, it is again a matter of making design variables explicit, etc.

At certain moments in the design process it seems as if this regression stops and we just form a concrete instance of a variable without making explicit what it is, i.e., there are no explicit variables describing what this something is, it is a pure atomic design form. The design process in this sense involves a series of choices: we choose variables for composite design forms; we choose atomic design form, etc. Reflecting on the resulting thing, it is natural to ask where these choices come from and what they are based on, if it is a good design or if a different series of choices could have resulted in something better. As we reflect on these matters we, at least implicitly, form a picture of a collection of design variables and a series of choices that builds the thing, i.e. we describe *a* design of the thing.

In interaction design for computer systems, use is traditionally in focus when determining design variables and their instantiation. We seek a solution that satisfies basic criteria for usability such as efficiency in use, low error rate and support for recovery from error, based on general knowledge about what to do and what not to do to meet these

criteria [cf. 12, 20]. We aim to achieve maximum usability with respect to a general precise notion of use and our design is motivated by this ambition. Thus it is reasonable to think that we can set up user tests in order to value the usability of the design. Such a test does not necessarily examine the strength of the inner design-logic that builds the thing and perhaps a different explication of what its use is would result in a better evaluation. But still, given a well-defined notion of intended use the user test will relate design choices to usability. For instance, we can perform usability studies based on methods from experimental psychology to assess to what extent the different criteria are fulfilled in comparison to some other design. This enables us to discuss and compare different designs with respect to a general functional definition of the designed things.

If we instead turn to artefacts as they are defined in terms of their place and role in everyday life —an existential definition— the situation is quite different. There is no longer a well-defined general notion of use that will cover all these “different” definitions in sufficiently many non-trivial cases and so the notion of a user is consequently somewhat blurred. Given the difficulty of providing a proper definition of use in this context, it is even hard to say what a user test would be here. The notion of *a user* is in general a difficult notion [cf. 11], but here it is as if *the* user disappears into thin air leaving the artefact and its expression behind, open to be used in various ways. Consider, for instance, evaluating a doorknob [cf. 21]: some doorknobs are certainly things that are present in my life with expressions that can not be captured in any non-trivial way by a general notion of doorknob usability.

When thinking about the presence of things, we seem to face a situation where we cannot relate general design and general evaluation to the existential definition of a specific thing. An existential definition is based on an act of acceptance, i.e. we turn to a thing and give it a place in our lives. Behind the various manners in which things present themselves to us there is something, which remains invariant with respect to all the different possible existential definitions. When we design for presence we have to relate design and evaluation to

some picture of this invariant “thing” that in some sense builds the things we define as we accept them to be present in our lives. Although this is a rather unfamiliar situation in human-computer interaction research, it is perhaps the basic perspective in art and design. In these areas, it is clear that we relate both design and evaluation to existential definitions of designed things. This is what we do when we picture what to design as we work on the design of a floor lamp. We clearly have a picture of something general, that may build meaningful things in several of our rooms, that can not in a simple fashion be reduced to something described in terms of the general use of a floor lamp. This is also what we do when we, as a basis for a richer experience, try to understand the inner logic of a painting or a musical composition. Here, the expressions of things become central.

3.1 Expressions

Our primary interest here is how computational things enter into our lifeworlds. To some extent this is something we actively do: we choose to have certain objects, such as a particular piece of furniture, a painting, or a mobile phone, around us. By giving things a place in our home we “invite” them into our lifeworld. But we do not actively decide to take them for granted as a part of our life: this is something that happens (or do not happen) over time. When we buy a new sofa, it is clearly visible to us and we note its presence hopefully feeling happy about our new sofa. Over time, however, the sofa will gradually “disappear” to us as we increasingly take it for granted. Eventually, there are objects in our near surroundings that we do not “see” until they are gone or when we suddenly discover that something has changed. While this gradual disappearance is characteristic of presence, what is central here are the first encounters with an object, i.e. we focus on what happens when it is introduced to us and an act of acceptance can begin.

This first invitation clearly has something to do with appearance: what an object is like as it makes its appearance in our life, when it presents itself to us. A thing always presents itself through its expressions. The expressions of a thing are its pure appearances as we disregard –or “bracket”– functional and existential definitions. It is what defines the thing as an abstract “expressional”, a bearer of the properties of expressions that are invariant across the many different existential definitions, i.e. an *expression-identity*. Similar to how we may think of a thing as an *appliance* – a thing designed to perform certain functions – we may think of the bearer of this expression-identity as an “expressional” – a thing that is designed to be the bearer of a certain expression¹.

Appliances and “expressionals” refer to two different perspectives on what it is that we design. When we design everyday things such as wristwatches, cars and furniture we in general consider both. As we consider the expression-identity of things – the “expressionals” – we, phenomenologically speaking, put the general notion of well-defined explicit use and of a well-defined user within brackets. Consider, for instance, the expression-identity of a chair: we use the chair to sit down and rest, to sit down and watch a movie, to sit down and work, etc. That people sit down in the chair belongs to the expression of the chair, but the users disappear as we refrain from referring to why they sit down and what they are doing sitting in the chair. If we think of a bicycle and what characterizes its expression, we do not think of it in terms of that it is used by Mary to go to the beach, or by a child that is learning how to ride a bike. Despite the fact that it takes a person to ride the bike, we just focus on the bicycle itself when we think of it. We may also think of a phone not in terms of an interaction model based on the notion of phoning, but instead in terms of an artefact with certain expressions, made from a certain kind of (technical) material,

1. We use the construction “expressional” along the same lines as the established word “confessional” – “a small enclosed stall in which a priest hears confessions”, i.e. as a thing designed to be a room for confessions.

that people use to build their everyday life. If we think about a phone in this way, we disregard, or “bracket”, the user and instead turn to the expressions as a foundation for existential definitions.

When we let things into our lifeworld and they receive a place in our life, they become meaningful to us. We can say that this act of acceptance is in a certain sense a matter of relating expression to meaning, or to give meaning to expressions. Sometimes this is an explicit act, as in gift-giving and rituals (consider for instance how the wedding ring is given its place in the ceremony), but more often this process of becoming meaningful happens gradually over time. However, in both cases the result is that things become bearer of meaningfulness through its expressiveness. It is this expressiveness and meaningfulness that is basic to design for presence.

We can also think of expressions as something characteristic to a thing, as it has entered into our lifeworld. For instance, when we look into the home of another person, the things we find tell something about this person beyond the functionality of these artefacts. In many cases, the precise meanings of a particular object to this person is not clear to us, but still they express something and as we see this, we can ask for what a particular thing is in terms of its presence. For instance, we might find an object of seemingly little value placed in a way that suggest that it is very precious to its owner and therefore ask for what it is (cf. [3]). Correspondingly, the owner of this home expresses herself with these things. Consider a musical instrument as an example: when we first see it, we might reflect upon its construction, its shape and proportions, whether it is new or old, made by a craftsman or a machine, etc. Then we might perceive it in its context; this musician’s instrument does not just lie there as one of many examples of what a music instrument is, it tells us something about the musician and the instrument’s place in her life. If I play the violin this thing helps me to express the meaning music has in my life to myself and other people. It is this type of musical expressiveness and meaningfulness that is in

focus when designing a violin and not usability in a more narrow sense. The notions of musical expressiveness and meaningfulness guide the design, they are the basic leitmotifs for the design process.

When I ask for what a thing is and what it expresses, I ask for the place it has in my life. This new usability or usefulness is not about instrumental functionality, but about the design and construction of things that can become a meaningful part of the environment and of our lives. Thus, we have to design these computational everyday things in ways that makes it possible for people to give them meaning, to give them a place in their lives, in various ways. This is quite different from creating technology that is just easy to use; it might even be the case that the artefacts that become most meaningful are not at all the ones that are easy to use.

We can relate this to Borgmann's notion of focal things as it is used in design practice: "Focal things /... / are things that ask for attention and involvement: they desire a practice that cannot be characterized by consumption but by engagement". [28, p. 41] [cf. also 1, 2]. Focal things are not designed to disappear; rather, they act as engaging centres in human practices. A violin, as a musical instrument in the hands of a musician, is a focal thing, while a Stradivarius placed in a museum, is not [1].

The concept of an "expressional" can be used as a basis for the design and evaluation of computational things in regards to presence, and also serve as a complement to use as a basis for interaction design. Thus, we design bearers of expressions as we design for presence, expressions that invite to acts of acceptance. However, we also need methods for comparing different designs with respect to a given type of "expressionals", methods for the systematic reflection and critique of expression-designs of computational things. This is where aesthetics becomes central.

3.2 Aesthetics

A narrow definition of use can give us external criteria for empirical user tests. Evaluations of the expression-logic of artefacts forces us to focus on the internal structure that builds the expression. When evaluating design with focus on existential definitions, we can look for what is invariant in regards to the expressions of the artefact, the identity of the object. We are not evaluating the thing as it is defined in an existential definition, but its expression-identity as a foundation for such definitions.

To try to understand and explain the logic of this expression-identity seems to be a reasonable basis for evaluation. It is a possible foundation for an abstract critical evaluation of the design of artefacts. Evaluation then turns into aesthetics: to understand the logic of an expression on the basis of understanding the material that builds the expression.

We may think of an expression as the presentation of a structure in a given space of design variables. The design itself can be seen as an act or a process that defines the expression. To understand and describe such phenomena is in a certain sense a matter of logic. Logic in a broad sense deals with formal matters, the general forms of certain specific things such as the forms of correct arguments. Form can be seen as the way in which matter builds a thing. Aesthetics, as we understand it, is concerned with how material builds expressive things, i.e., a logic of “expressionals”.

It follows that good design from an aesthetical point of view basically is a logical question, not primarily a question of psychology, ethnography, sociology etc. It is a basic axiom here that it is through the force of its inner logic, its consistent appearance, that a thing receives depth in its expression and thus its strength to act as a placeholder for meaning. Behind each expressive thing present in our lives there is an “expressional” with a strong form. From an aesthetical

point of view this is also what is the foundation for the character we ascribe to things (cf. [16] for a discussion about the character of computational things.)

To design with aesthetics in focus means to concentrate on appearance as constituting the essence of things, how a thing manifests itself in a world of expressions [cf. 37]. This is much easier to acknowledge in the areas of art and music critique. Consider for instance a valuation of the 2nd Brandenburger concerto by Bach: what is it that such a valuation would refer to? Probably not the precise notational text of the Bärenreiter edition no X nor a particular performance by Concentus Musicus. It would be something much more abstract, a specific expression that is invariant with respect to all various performances, i.e., the musical idea as it is expressed through notational text. In the same manner we will have to trace the idea of computational things as we try to understand the logic of their expression-identities.

Consider a typical graphical user interface (GUI) on a desktop computer. Components of the interface can be seen both as constituents of an interaction model and as constituents of an expression structure. It is the expressions of these components that convey the meaning they have in the interaction model and it is also the expressions that talk to me as I form an existential definition of the GUI in my daily work with the machine. To make sense of the interface structure means in a certain sense to describe and evaluate its expressiveness. This is comparable with analysing the logical form of an argument and evaluating its logical correctness.

We have yet no stable tradition of aesthetics within the domain of human-computer interaction that, in a systematic way, will help us reflect upon the expressions of computational things in this manner. However, as computational artefacts become more and more important in our lives, their importance as existentially defined objects will increase. This, in turn, will force us to begin to reflect on the aesthetics of computational artefacts. As a basis, we can use critical design, experimental design and similar approaches [cf. 5, 8, 9, 13].

Over time, these reflections will help the human-computer interaction research community form a tradition of aesthetics to complement the experimental tradition of usability studies.

4 The Expression-Identity of Computational Things

To understand the expressions of computational things, we have to search for intrinsic properties of their expression-identities, i.e. basic properties of computational “expressionals”. In, for instance, graphical design and many areas of industrial design, form giving often means to design the exterior of an object. This is reasonable when the object is sufficiently static and when its internal workings do not contribute to the overall expression. If we think about the material that forms the expressions of computational things, it is clear that it is a combination of computations and interaction surfaces. Clearly, “aesthetical design” of computational things is not to give a computer a new and more colourful shell [cf. 4].

We may say that the expression-identity of computational artefacts is based on a combination of time structures (computation) and space structures (manipulation and display of results). Computational expressions have many similarities with musical expressions, as both concern temporal rather than spatial structures. Therefore, a proper aesthetics of computational things concern “time gestalt”. However, interaction design also depends on spatial manifestations of the results of computations for various forms of input. We use displays, keyboards and other instruments to control computational processes and to see the results. Therefore, the expression-identity of a computational thing is based on both temporal structures and spatial manifestations.

Design for presence also requires a different perspective on what timespans we are designing for. The processes we design for in human-computer interaction often take place over hours, minutes or even seconds. When thinking about the interaction with computers in terms of dwelling, the time-spans in focus are much longer, e.g., days, weeks or even years. Of course, these long time-spans are considered in present interaction design as well as many systems are going to be used for quite a long time in an organisation, but the issue here is what we focus on when designing [cf. 17, p. xxxii]. Considering the point made by Weiser quoted in the introduction, we might say that while interaction is supposed to be fast, dwelling is not.

To design computational “expressionals”, we can use design *leitmotifs* that support reflection upon the interplay between temporal and spatial structures. One such leitmotif is to think of the computational artefact as a display.

4.1 An Aesthetical Leitmotif: Computational Artefacts as Displays

As a basis for the design of an artefact, we always have some picture or idea of what kind of thing it is. Such a picture leads our thoughts in certain directions and can thus function as a key notion in a normative design philosophy; the picture helps us focus on certain aspects of the given class of things even if it, as a description, is highly incomplete. We have argued that a focus on the expression-identity of things seems to be reasonable when designing for presence, i.e., to acknowledge aesthetics as a basis for design. What sort of pictures could help us to focus on the expression-identity of computational everyday artefacts?

One such approach could be to consider the computational artefact as a thing displaying the execution of programs. A computational thing in this sense is not necessarily an electronic device; clocks, mechanical pianos etc. are also examples of such computational things. The

expression of a computational thing depends on the execution of programs. Interacting with computational things means that we give values to program variables and initiate execution of programs in various manners. Time is a central form element for a computational thing in the same sense as time is a central form element in music. The picture of a computational thing as something displaying the execution of programs leads us to focus on expressiveness where time is a central form element. To open up for existential definitions of a computational thing, we can ask questions such as:

- i) In what way and in what sense does it express the execution of a program?
- ii) What determines what to be displayed?
- iii) What initiates the execution of programs?
- iv) What defines the given programs?

As we acknowledge a computational thing to be present in our daily life, we of course use it to do various things: we phone our friends, we remind ourselves of things to do, we listen to music, etc. To focus on expressiveness in design does not mean that we forget all about the use of computational things – it means that usability becomes subordinated to expressiveness when designing according to this leitmotif. A computational thing is a thing displaying the execution of programs: an “expressional” more than an appliance. We can use it to do different things, but its general definition is not given in terms of use.

Consider asking these questions about a phone in order to get a new “picture” of what a phone is. Is not the old picture very much a matter of how a phone looks as it is used, i.e. a matter of expression, as when we mimic using a phone by pointing the thumb to the ear and the little finger to the mouth? To take the traditional stationary phone as a starting point, rather limits the design space than open up for new perspectives. Instead, we could try to consider different types of display expressions by setting up collections of design variables as answers to the questions (i) - (iv). In this way, we define what a phone

could be as a computational thing. The better we resist retreating to the old notion of a phone, the better chance we have of finding a new and useful design space. The notion of a computational thing as a thing displaying the execution of programs could help us here to focus on the phone as a more general class of expressions where time is a central parameter.

Assume that we will design a digital doorbell. A doorbell is something we use to call the attention of people inside as we stand outside in front of a door, to notify that someone is at the door. There is nothing in this description that refers to the expression of a doorbell. We can also describe a computational doorbell as a thing that displays the execution of a certain program everywhere inside of a compartment or a house as it is initiated outside a given door. This is a distinction between describing the notion of a doorbell in terms of use and describing what thing a computational doorbell is, in terms of its expression. In the first case, we will probably consider what it means to call the attention of people. In the second case, we will consider what it could mean to display the execution of a program everywhere in a house.

In contrast to the expressions of an artefact, its usability concerns the more abstract notion of use, i.e., the use of it. It is at this point that the definition of what a thing is enters the scene. We could design our doorbell on the basis of a rather precise definition of use, but such a definition would restrict the design space concerning the expressions of doorbells and it would rest on several assumptions concerning the forms of the existential definitions we implicitly, or explicitly, make as we acknowledge the presence of the doorbell in our daily life. If we, on the other hand, start with a general description of what thing a computational doorbell is in terms of its expression we may open up the design space and also make less assumptions on the forms of existential definitions to come.

5 Concluding Remarks

We have argued that the use of new computational things in everyday life, implies a shift from efficient use to meaningful presence. Many of these new computational artefacts will be defined by their intended use, e.g., the way information appliances are defined by the task or situation they are supposed to be used in [18, 22]. However, some of them will also be a part of someone's life in a more profound sense than as tools to bring forth when needed; the artefacts that surround us are more than components of a continuously available toolbox, they are present in our lifeworlds as parts of who we are, how we live and how we express ourselves.

Presence, as we understand it here, concerns the existence of things on the basis of an existential definition of what they are. We have described the presence of an artefact in terms of how it expresses itself as we encounter it in our everyday life. Then we can think of artefacts as "expressionals", artefacts as bearers of expressions rather than functions.

There is an immediate connection between the expression of a thing and various concrete forms of using it. This is related to the concept of affordances [cf. 7, 10]. Affordances also concern the meaningfulness of objects in relation to an agent but an important difference is that while these existential definitions of objects are made in terms of being present in someone's lifeworld, affordances are defined from an ecological point of view.

The perspective on artefacts as expressing something, rather than as being specifically used for something, places aesthetics in the centre of design. Aesthetics is not about the creative or artistic surface of these everyday computational artefacts, but about how their expressions form an identity that can make them meaningful building blocks in

someone's lifeworld. Then aesthetics, as a logic of "expressionals", gives a methodological context for the "expressional" foundations of existential definitions of computational things.

When we focus on aesthetics one can get the feeling that we completely leave issues of truth and falsity, of good and bad aside. This is not at all the case. Aesthetics in focus means that we focus on expressions as a leitmotif for our road to understanding, not that we focus on the expression of things as static isolated items. Note the close connections between aesthetics on the one hand and epistemology and ethics on the other. Beauty and simplicity are often used as strong criteria for the correct path to deep theorems and good theories in areas such as mathematics and physics [cf. 26]. If I design a glass bottle, I ought to know that it partly broken can occur as a weapon in a fight and that this is part of the expression of a glass bottle. An existential definition of a thing means that I take care of how I concretely use the thing; I declare a position with respect to the expression of the given thing. When I place a stone in my garden as a decoration I implicitly declare that this is not a stone to crash windows with — when some younger person perhaps do just this, then this might be a reaction to my definition of what the stone is. All this leaves the designer in a classical existential situation with respect to her/his responsibility.

The two ways of describing and defining an artefact –in terms of use or presence– are complementary perspectives. Consider how we evaluate a piece of furniture both in regards to functionality and expressions: when we buy a sofa, we do not only consider whether it is in principle comfortable to sit in, we also ask ourselves whether its materials, design etc. will fit into the rest of the environment in the way we want. We both consider its practical functionality as a sofa and its prospective expressions as a sofa placed there in our living room. This is also acknowledged in many forms of design for everyday life, such as in architecture, interior design, furniture and clothing design [cf. 19, 23]. In the case of interaction design of computational artefacts, things seem to be different. Certainly, there is a very strong tradition of

experimental psychology, but there is no corresponding tradition of aesthetics in relation to the existential definitions of a thing in human-computer interaction design [cf. 5].

Thinking in terms of presence opens up new design spaces. It has been argued that mature technology becomes transparent to its users. The ideas presented here point to a situation where the computer loses its unique position, and computational technology simply becomes one out of the many different materials we use to build everyday life. Of course, it will be a material with special properties, such as having form based on both temporal and spatial structures, but from an existential point of view, we will think of it as just another material: everyday computational things will be as familiar as everyday wooden things, everyday plastic things, etc. Eventually, they will be just “things” present in our lives, made out of materials we do not necessarily think about. Then, the computer has disappeared.

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