Designing is the Construction of Use Plans

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Abstract In this chapter, I argue for an intentionalist reconstruction of artifact design, called the "use-plan analysis." In it, design crucially involves the construction and communication of a use plan. After presenting an outline of the use-plan analysis, I show that it can be used to accommodate four aspects of the phenomenology of artifact use and design: creative use, serendipity, the unread manual, and unknown designers; and I briefly indicate how the analysis facilitates the evaluation of artifact use and design. From this, I conclude that the use-plan analysis provides a phenomenologically viable, evaluatively useful, intentionalist account of use and design.

1 Introduction

Designing is of vital importance for every human society – from early tool-users to heavily technology-dependent contemporary societies. The products of designing range from skyscrapers to microchips and weather satellites to wicker baskets. Yet accounts of design, especially within analytical philosophy, are as rare as Siberian tigers – and not nearly as actively searched out.

In this contribution, I do not aim to set this straight by giving a complete analysis, let alone a clear-cut definition of designing. Instead, I present a framework for understanding at least one important type of designing, namely that of run-of-the-mill consumer utensils, such as cars and toothbrushes. This use-plan analysis starts from the seemingly trivial observation that designing is, like scientific research or swimming, an activity. One may therefore apply to designing resources drawn from one branch of analytical philosophy, namely philosophy of action. This discipline is mainly concerned with understanding *intentional* actions, i.e., actions that express purposefulness and deliberation.

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I present in section 2 an analysis of designing, and, more cursorily, using, as an intentional action involving *use plans* for material objects. Here I aim at clarity and conciseness, not at completeness. Many details of the use-plan analysis, developed in close cooperation with Pieter Vermaas, and of its application are omitted here and can be found elsewhere (Houkes et al., 2002; Houkes and Vermaas, 2004; Vermaas and Houkes, 2006; Houkes and Vermaas, 2006).

The presentation is followed by a preliminary assessment of the use-plan analysis, again aimed at clarity rather than completeness. In section 3, I show how the use-plan analysis provides a phenomenologically viable framework for understanding designing by accommodating four aspects of artifact design and use. These aspects are presented as criticisms, because they appear to offer grounds for objections against the use-plan analysis, and for accepting alternative accounts. I then show the phenomenological mettle of the use-plan analysis by responding to all four criticisms. Some of these responses show, in addition, the primary advantage of the use-plan analysis, namely that it may be employed to evaluate using and designing. In section 4, I briefly sum up these evaluative features, and I conclude that the use-plan analysis provides a phenomenologically viable, evaluatively useful, intentionalist account of designing.

2 The Use-Plan Analysis of Designing

The use-plan analysis of designing is an action-theoretical account developed by Pieter Vermaas and myself and presented in several publications (Houkes et al., 2002; Houkes and Vermaas, 2004; Vermaas and Houkes, 2006; Houkes and Vermaas, 2006).[1] Central to this analysis is the notion of a use plan for an artifact: a series of actions, including deliberate manipulations of the artifact which are considered by an agent for achieving a certain goal.

As an example, consider a prototypical designed object or artifact: a car. Driving a car is an activity that is typically purposeful and that always involves several contributory actions. These actions may be rather trivial, such as sitting in the driver's seat, or relatively complicated, such as operating the clutch. Yet several such actions are involved in driving a car. Moreover, this set of actions is typically structured as an ordering. Some actions, such as fastening one's seat belt and checking the fuel level, may be taken in any order; other actions, however, such as engaging the clutch and shifting gears, need to be taken in strict succession. Actions when driving a car may be conditional for other actions and conditioned by other actions: one has to open a car door to switch on the radio, which in turn enables the selection of a different radio station. That the actions comprised by driving are structured as orderings, partial or complete, and by conditionals means that driving can be understood in

[1] The use-plan analysis is similar to at least one characterization found in design methodology (Hubka and Eder, 1998) and resembles others (e.g., Roozenburg and Eekels, 1995). For lack of space, neither these similarities nor the equally significant differences will be discussed here.

terms of a plan – a structured, temporally extended series of (considered) actions.[2] Many plans, but not all, involve deliberate manipulations of material objects other than our own bodies. Such plans may be called *use plans* for these objects. Thus, the typical series of actions starting with opening a car door and leading to the release of the hand brake may be called the use plan of a car, but also of a car door and a hand brake, and perhaps of the engine and the spark plugs. In contrast, walking through a park may involve a plan, e.g., for meeting people, but analyzing this activity as involving a use plan for the grass would make the notion of a use plan virtually all-encompassing and therefore uninteresting. Whether use plans can be distinguished from plans in general in any precise way need not concern us here.

Of more interest is the source of the structure of use plans: *why* do some actions in driving a car need to be taken in strict succession, whereas the order of other actions is arbitrary? It may be difficult to recognize this as a genuine question, mainly because the answer is so obvious: if some actions are taken in a different order, one has little hope of achieving the goal of driving one's car, whereas the order of other actions is irrelevant for achieving this goal. Thus, the structure of the use plan for an artifact ultimately depends on the goal to which using the artifact is supposed to contribute. If you want to use a car for driving, releasing the hand brake at some point, but not too soon, is crucial; if you only want to listen to the car radio in your garage, releasing the hand brake is at best unnecessary.

Borrowing a term from philosophical action theory, the structure of use plans may be said to depend on *practical rationality*,[3] a value that encompasses at least effectiveness and efficiency. Some, but certainly not all structure of plans derives from this value. Opening the door for a passenger before opening the driver's door may be necessary to be a polite driver, but it is hardly needed to be an effective driver. Similarly, fastening the seat belt before setting the car into motion may be required for safe driving, but it does not improve the effectiveness of one's driving. As a first approximation, the use-plan analysis does not include values such as safety and politeness. Use plans are sufficiently structured by effectiveness and efficiency alone to warrant this approximation for the moment.

As may be clear from the above, using an artifact can be characterized as executing a use plan for that artifact. Thus, you use a car when you execute the typical plan of opening the door, starting the engine, releasing the hand brake, etc.; but baking an egg on your car's bonnet in the center of Death Valley also counts as use of a car, although an atypical use plan is executed.

Characterizing designing in terms of use plans is marginally more complicated. On the use-plan analysis, designing primarily and necessarily involves constructing a use plan and communicating this plan to other agents.[4] Thus, designing is the

[2] See Bratman (1987) and Pollock (1995) for general action-theoretical analyses of plans.

[3] "Practical rationality" is only one of a number of semi-technical terms introduced by philosophers to analyze reasoning that is related to actions rather than beliefs. "Instrumental rationality" and "means-end rationality" are other terms. For the purposes of this chapter, the various terms are mutually substitutable: their differences (if any) are too fine-grained to matter.

[4] A designer might only communicate the use plan to him- or herself by committing the plan to memory. Such "personal" designing is a borderline case of the use-plan analysis.

source of the use plans available to agents in a community: designers think up use-plans and communicate them, typically to other agents, to help these agents to achieve their (the other agents') goals. Schematically, designing starts with a goal; after which a use plan, consisting of an ordered sequence of actions by which the goal can be achieved, is developed and communicated. Typically the plan includes manipulations of artificial objects. And typically some of the objects to be manipulated do not yet exist, in which case the designers go on to describe the objects concerned and the way in which they can be manufactured. The latter activity may be called *product designing*, which is nested within a broader activity called *plan designing* (Houkes et al., 2002). This analysis emphasizes the "instrumental" or "goal-oriented" aspect of designing over its "productive" or "object-oriented" aspect. Product designing is secondary, since the product is selected or described for its role in executing the plan, and it is optional, since an agent who constructs a use plan that only involves existing artifacts and/or natural objects satisfies all conditions for (plan) designing. Thus, labeling an activity "designing" generally presupposes the existence of a use plan and a group of prospective users.

The emphasis on plans over production carries over to the interaction between designers and users. The goal of designing is to assist users in achieving their goals; to this effect, designers construct use-plans that may be executed by users and, possibly, previously non-existent objects to be manipulated. To achieve their goal of assisting users, designers should not merely hand over these objects – and they usually do not. Typically, new artifacts come in boxes and wrappings accompanied by handbooks with pictures and texts, which communicate how the artifacts are to be used and for what purpose, or vendors, trainers, and commercials may show how artifacts should be used. This is readily explained by the use-plan analysis. In it, designers need to communicate the actions and goals that constitute the plan, unless the use-plan may be assumed to be familiar to the potential users. Without implicit or explicit communication of the plan, designing fails to be of assistance to others, and can be evaluated as (practically) irrational.

Before closing this brief overview, two remarks are in order.

One, the use-plan analysis is intentionalist in the sense that it refers explicitly to the mental states, beliefs, desires, and/or intentions, of designers and users; in executing a use plan, users act more or less "in accordance with" designer intentions. Intentionalist analyses of use, design, and artifact functions have several major problems, including the indeterminacy of intentions.[5] It is, for instance, unclear whether users act "in accordance with" designer's intentions by merely buying their products. The use-plan analysis overcomes these problems by focusing on more structured mental states, namely plans, which have a broad belief base, and by requiring communication of these plans.

[5] Naïve intentionalism regarding using and designing may be a polemical starting point for anti-intentionalist accounts rather than a position held by actual persons. Intentionalist analyses of artifact functions are found in, e.g., Neander (1991) and McLaughlin (2001); Vermaas and Houkes (2006) identify problems for such analyses and develop a use-plan analysis of functions to solve these problems.

Two, the use-plan analysis is primarily a reconstruction that retrospectively models the beliefs held by, the decisions made by, and the actions taken by a rational designer, in order to satisfy the standards of practical rationality. In doing this, the use-plan analysis ignores many aspects of actual designing: among other things, it does not consider the interaction between designers and manufacturers; it merely touches upon the role of safety regulations and standards in designing; and it has nothing to say about teamwork in designing. This is not to say, however, that the analysis is completely insensitive to the phenomenology of using and designing, as I will show in the next section.

3 Accounting for Actual Use and Design

In this section, I consider four objections against the use-plan analysis. All of these objections are inspired by the phenomenology of artifact use and design, and by existing anti-intentionalist accounts of these activities, philosophical or otherwise. However, for the sake of clarity, I have schematized and increased the critical portent of the phenomena discussed to such an extent that the objections only resemble points raised in the literature; I have largely omitted references to avoid possible straw-man fallacies. The goal of this section is, in any case, not to polemicize against existing or possible anti-intentionalist accounts, but to show how the use-plan analysis provides a phenomenologically viable framework for understanding designing.

3.1 Creative Use

It may be objected against any account of artifact use that centers on designer's intentions, that actual use is not necessarily or even typically related to the efforts of designers (e.g., Preston, 2003). In many cases, users have invented new ways to use existing artifacts, have modified the artifacts accordingly, and have communicated alleged successes to others. Examples range from the rustic to the revolting: the use of beer to keep slugs from eating garden vegetables has been discovered and communicated by various gardeners, and is currently promoted by organic gardeners, not by any brewing company; and it is unlikely that any airplane manufacturer imagined, let alone promoted the idea, that some of its products could be used as flying bombs as in the 9/11 terrorist attacks.

In all of these cases, part of the use-plan analysis applies: agents construct and communicate use plans, which may then be executed or rejected by others, for instance on the basis of their effectiveness. Yet the plan-constructing agents are not designers, but users. Thus, the objection targets the use-plan analysis insofar as it exclusively reserves plan construction for designers, which it does explicitly.

Phrased in this way, the objection may immediately be turned into a response. Creative use does not show that designer's intentions are irrelevant for actual use. Instead, it shows that agents who typically use artifacts can occasionally, or even regularly, be designers, i.e., the constructors and communicators of use plans. The use-plan analysis concerns *roles*, and does not make any claims about which agents may play these roles. Just as agents engaged in designing, say civil engineers, are typically also engaged in using artifacts, for example when driving to their work or brushing their teeth, so agents who are typically engaged in using can occasionally or regularly engage in designing. In the examples given above, the creative users were designers by definition: in constructing and communicating a use plan, they have fulfilled all the conditions for playing this role.

This does not mean, however, that there is no distinction between agents who occasionally engage in designing and those who do so on a daily basis. Apart from relevant experience and expertise, which may improve the quality of the designed use plans, it is an elementary social fact that some agents are *professionally* engaged in designing, and other agents are not. Contemporary societies are characterized by a multitude of divisions of labors and specializations; that between professional designers and, for want of a better term, "consumers" is one such division. This social mechanism does not make designing by consumers impossible; it does not make the use plans produced by professional designers rational by definition; and it does not preclude "consumer designers" from producing rational use plans. However, the distinction between professional and non-professional designers shows up in several normative notions, such as that of "improper" use, which serve to privilege – socially and legally, if not rationally – some use plans over others. These notions, and the tension between the rational reconstruction and the social mechanism, form the backbone of the use-plan analysis as an evaluative framework for artifact use and design. In section 4, I list the basic elements of this evaluative framework, and indicate some further ramifications.[6]

3.2 Serendipity

Another objection may target the description of the design process given in section 2. Actual designing is not a linear process. Designers do not start with a user goal, which is then translated into specifications, which are subsequently and successively satisfied by constructing a use plan or a material object with particular physical features. In reality, designers switch back and forth between specifications, plan

[6] Many anti-intentionalist accounts of artifact use and design, most notably constructivist accounts in Science and Technology Studies, lack evaluative notions such as "expertise" and "properness", or lack ways of relating such notions to values such as practical rationality. Recently, a similar lack has been noted by prominent researchers in this tradition, most notably Collins and Evans (2003).

designing and product designing, continuously reframing the problem that they are trying to solve, testing solutions in various stages of development, etc.[7] Here, I consider only one way in which the use-plan analysis may fail to match design practice; the response to this criticism also applies to many other alleged failures.

In some cases, the end product of designing does not satisfy its original goal, but it may be successful nonetheless. One familiar example of such an "unplanned product" is a type of glue, developed by Spencer Silver, which did not turn out to be the looked-for strong adhesive, but a very weak one. This unsuccessful product was later, and by another designer, found to be very effective for another application, namely for removable self-stick notes, and so effective that it became the basis for one of the most successful office products of recent times.

These serendipity effects in designing seem to undermine the intentionalist basis of the use-plan analysis. The end product has only a tenuous relation to the original designer's intentions: the product does not turn out to be what the designer expected. Still, these unintended products exist, they are successfully marketed and used, and they may be as common as "as-predicted" products.

In response, it should be noted that serendipity only undermines some naïve intentionalist accounts, namely those which emphasize a designer's *original* intentions. There is no need for an intentionalist account of designing to be this restrictive: as long as there is a clear basis for selecting some mental states of the designer, or other agents, as focal points of the analysis, intentions may change. The basis for determining the relevant intentions for the use-plan analysis, is provided by the requirement of communication: different use plans may have been constructed, or just entertained, at different points in the actual design process, but only communicated use plans add to the resources available to users. These users may be, and in the case of components typically are, designers of other artifacts (Vermaas, 2006).

In the self-stick notes case, the use-plan in which Silver's material was to be a type of glue *was* communicated, and it provided the basis for evaluating the material as a failure. Then, a different use plan was constructed, in which the existing material played a different role; this plan was effective, and it was communicated to users of the end product, namely self-stick removable notes. Both the construction of the "glue" plan and the material, and that of the "self-stick removable" plan count as designing on the use-plan analysis; the plans can be easily distinguished, and they explain the change in the evaluation of the product. That one component of reusable self-stick notes was previously an unsuccessful type of glue is irrelevant for evaluating its use for these notes.

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[7] There is a rich body of literature in design methodology that tries to represent designing as (very loopy) flowcharts. The phenomenology of designing suggests that any such chart is an impoverished representation, because of the reframing described in the main text; see, e.g., Schön (1987) and Bucciarelli (1994) for examples from various types of engineering design.

3.3 The Unread Manual

Following up on the serendipity response, one may target the communicative aspect of the use-plan analysis. In this analysis, designer's intentions – structured as a use plan – are the content of some communicative act, meant to address the community of users. Perhaps this account may be developed in sufficient detail, for instance by applying a Gricean theory of communication. But this, so the objection goes, would be a waste of effort. Even if designers attempt to communicate their intentions or plans clearly, and if this communication can be analyzed in some sophisticated manner, no user is interested anyway. Studies into user behavior show time and again that users do not read manuals or pay much attention to any other form of elaborate verbal communication. Yet if use plans are such extensively structured patterns of action, elaborate verbal communication seems to be the only way to communicate them. So whatever analysis is chosen for the communicative actions of designers, it is inappropriate. No-one is listening on the other side of the line.

This objection may be strengthened by a positive account of artifact use and design. Users do not need to pay attention to the communicative efforts of designers, because they already know how to use the vast majority of artifacts that they encounter. Beds, teapots, toast, and newspapers – to give some examples from daybreak onwards – do not come with manuals, nor do users often consult any other information regarding their use. All of these artifacts play their role in an existing, well-established practice. Designers seem to have little freedom to deviate from these practices: designing is not just constrained by physical (im)possibilities, standards and regulations, it is also constrained by traditional patterns of use. For many artifacts, especially simple ones such as teapots and toothbrushes, designers seem to have little choice but to adopt the familiar use plan, because users will execute this plan anyway.

In combination, unread manuals and inflexible existing practices suggest that communicating a use plans is like trying to steer a whale: the only way to pretend one has achieved success and to avoid frustration is to follow the whale's lead and direct it to where it was headed anyway. The use-plan analysis appears to ascribe to designers an unrealistic amount of freedom and authority.

The response is two-sided. First, it may be pointed out that designers are much more effective, and creative, in communicating their use plans to users than suggested above. Manuals are far from the only communication means available, and designers actively search for ever more effective means to promote or discourage user behavior. Commercials and advertisements often focus on the novel features of artifacts, and show users employing these features – which is a clever way of communicating changes or additions to the traditional use plan. Many products guide user behavior by their designed physical features, in ways that the users may not even be aware of.[8] Of course, users can ignore this communication and continue

[8] Well-known examples are speed bumps and the heavy hotel key described by Latour (1991).

to use an artifact in the established way, or refuse to use a novel artifact. But these failures do not detract from the many successful communications of new use plans: most people in fact use their car or toaster exactly as described in the manual.

This leaves the steering-the-whale point untouched. Perhaps designers just follow the users' lead and (superfluously) communicate the traditional use plan. However, the source of the use plans communicated by the designers, and their success in changing user behavior, is not of primary importance to the use-plan analysis. What matters is the justification and communication of these plans: designers should guarantee the rationality of the plans, meaning that they could, in principle, underwrite and endorse existing plans with some small changes.[9] This may decrease the practical impact of their communicative efforts, but it does not affect their evaluative relevance. If an artifact fails to work as expected, and a user complains to the manufacturer, the latter may in some cases point out that the user failed to conform to changes in the use plan. Suppose, for instance, that someone trades in her old car for a new type, exactly the same as the old apart from its being outfitted with a catalytic converter. The driver uses the car exactly as her old one, including filling it with leaded fuel. If she then would complain to the car dealer, after some time, about the poor performance of the car, it might be pointed out to her that she used the car incorrectly: she should have changed her use plan to one that included filling the tank with unleaded fuel, because the use of leaded fuel clogged the converter and reduced the performance of the car.

That poor performance, related to changes in the use plan, may be blamed on the user does not, of course, discharge designers and manufacturers from the responsibility of communicating such changes to the users: if the car owner described above had no way of knowing that she was to use unleaded fuel, she cannot be blamed for the poor performance of her car. However, that designers have this communicative responsibility vindicates the use-plan analysis instead of undermining it.[10]

3.4 Unknown Designers

Many artifacts, such as camera cell phones, are state-of-the-art gadgets. These are typically manufactured by companies that clearly communicate, and legally protect, the origins of the artifacts and their use plans. Yet the origins of many other artifacts

[9] An agent who adopts an existing use plan and communicates it without making any changes in either the plan or the artifacts involved is not a designer, neither intuitively nor on the use-plan analysis.

[10] Real-life cases are considerably more complicated than suggested by either the use-plan analysis as described here, or by accounts that emphasize the inertia of practices. Take, for instance, recent lawsuits regarding certain types of "light" cigarettes. Here, the responsibility of manufacturers to communicate that these cigarettes are as detrimental to the smoker's health as other types must be weighed against the responsibility of users to care for their own health, common knowledge regarding the effects of smoking, etc. The use-plan analysis may provide a framework for analyzing such cases; it does not offer an easy way to make decisions regarding them.

and plans are less well advertised. Pots, rafts, and hairpins have seen scores of generations of use, and were undoubtedly designed first by some agent or, possibly, by several agents simultaneously. But archaeology is not an exact science in the sense that it can pinpoint the precise moment and the identity and intentions of the original designer of these time-honored utensils.

More importantly, establishing these facts may be of historical interest, but it is irrelevant from a practical perspective. Some of us know how to use rafts, for various purposes, and they know how to instruct others in their use, wherever, whenever and by whomever rafts were originally designed. Neither the designer's identity nor his or her intentions appear to have any relevance for evaluating and understanding the existing practice of rafting.[11] And the reason is not that the designer's intentions are as yet unknown, but that they would be irrelevant even if they were somehow revealed.

There are two reasons why this observation about artifact use may be acknowledged without giving up intentionalism. One is a phenomenon that might be called epistemic or evaluative screening. Throughout history, people have used pots, rafts, and hairpins, often successfully and sometimes unsuccessfully. Such successful use provides evidence for the rationality of a use plan, evidence that is at least as strong as the considerations that might have guided the designer (Houkes, 2006). This means that, as far as the quality of the use plan is concerned, the designer's communications have become largely irrelevant. Initially, users might have relied on the designer's word that using an artifact in a certain way would be effective, but this testimonial evidence has been supplemented and replaced by the experience of users. However, as long as the executed use plan matches the designed one, the original communication still determines the use of the artifact, and the evaluation of this use, albeit indirectly. Of course, generations of users will typically change the way of using traditional artifacts; but this creative-use phenomenon was already found not to undermine intentionalism.[12]

There is another reason why unknown designers do not threaten use-plan intentionalism. Toothbrushes, to give one example, have been in use for some time. Yet most people do not use a toothbrush that has been passed down the generations. This "paradox" is easily resolved by distinguishing an artifact type from individual artifact tokens: I bought the token standing in a glass in my bathroom some months ago, while the type has been in existence for a significantly longer time. And distinctions do not end there. In any well-stocked drugstore or supermarket, you have a choice between several types of toothbrushes. These may differ in the stiffness of their hairs (ranging from "soft", through "medium", to "hard"); they may or may not have an adjustable head; they come in different age categories (ranging from

[11] This argument suggests an anti-intentionalist account of the history of technology that stresses the way in which practices of artifact use have gradually emerged, stabilized, adapted and/or disappeared in the course of time. Such accounts of the history of technology often take an evolutionist form (see, e.g., Basalla, 1988).

[12] Note that, if the user of an artifact constructs and communicates a different use plan, she counts as a designer, but her testimonial evidence is, again, rapidly screened-off and replaced by user experience with the new use plan.

"baby" to "adult") and in different colors. And for any of these varieties, several brands may be available. Not all of these differences affect the use of the toothbrush: you may just as effectively use a yellow one as a red one. Yet some differences are relevant: brushing a baby's teeth with a hard adult brush is assumed to damage the baby's newly formed enamel, which makes brushing ineffective in the long run. Thus, there is a practically relevant distinction between toothbrushes as a general *kind*, several *types* of toothbrushes currently available, and individual *token*s bought and used by consumers. The unknown-designer phenomenon is only prominent on the level of (some) artifact kinds; it does not, in general, apply to artifact types. For each type available in stores, its origin is clear: there is a manufacturer who communicates the use plan of this toothbrush-type and who takes responsibility for the rationality of this plan.

Thus, the unknown-designer phenomenon is accounted for in different ways, on different levels: at the level of artifact kinds, its impact is minimized by pointing out the effects of epistemic and evaluative screening-off, which show that designer's intentions are not irrelevant, but just screened off by supplementary sources of evidence. At the level of artifact types and tokens, the phenomenon was argued not to play a large role, designer's and manufacturer's intentions are communicated and they are evaluatively relevant.

4 An Evaluative Conclusion

In this chapter, I have presented the use-plan analysis of artifact use and design. In this use-plan analysis, design crucially involves the construction and communication of a use plan. I have argued that the use-plan analysis is intentionalist: it emphasizes the mental states of designers and users in reconstructing their activities. Furthermore, I have shown how the use-plan analysis can accommodate four aspects of the phenomenology of artifact use and design that, at first glance, appear to ground objections to it: creative use, serendipity, the unread manual, and unknown designers.

Furthermore, I have indicated that the analysis provides a framework for evaluating artifact use and design. As presented here, this framework rests upon three evaluative notions: rationality, properness, and expertise. The central element is practical rationality. Plans can be evaluated in terms of their rationality, and because use and design can be analyzed in terms of plans, the standards of rationality also apply to those actions. The value of rationality is hardly comprehensive, since designing and using are not evaluated just in terms of effectiveness and efficiency; other values, such as safety and durability, have not been addressed in this paper. A value that *was* covered earlier is the notion of (im)proper use. This value cannot be derived from that of rationality: on the use-plan analysis, any use plan that answers to the standards of practical rationality is 'acceptable' in the important sense of being effective and efficient. One can, however, add to the evaluative framework a distinction between professional and non-professional (re-)designing. As described in section 3.1,

this distinction reflects a division of labour that exists in most contemporary societies. Thus, use plans constructed by professional designers are socially and legally privileged over those constructed by non-professional designers although, again, improper use, based on "non-professional" plans, may be highly effective. By adding a third element, one may go beyond treating the division of labour as a brute social fact: one may take professional designers as experts. Yet on the use-plan analysis, their expertise does not primarily concern products, but rather ways of effectively realizing goals. That professional designers are often taken as experts is shown by reliance on their testimony: when asked why they believe that a new car can be used effectively for personal transportation, most people would probably reply that it has been designed for this purpose. Typically, this expertise becomes superfluous after a while: when someone is asked why she believes that her five-year old car can be used effectively for personal transportation, she would probably refer to her own experience in using it rather than to its being designed for transportation purposes. This change in evidence indicates that the relation between designers and users is not merely social, but social-epistemic (Houkes, 2006), and therefore an appropriate topic for further evaluative inquiry.

The evaluative framework presented above is far from complete, but it does contain several notions that are practically relevant and that cannot be found in other philosophical analyses of designing. Therefore, I conclude that the use-plan analysis provides a phenomenologically viable and evaluatively useful account of artifact use and design, in which intentions play a vital role.

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