

terms of a plan – a structured, temporally extended series of (considered) actions.<sup>2</sup> 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*,<sup>3</sup> 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.<sup>4</sup> Thus, designing is the

<sup>2</sup>See Bratman (1987) and Pollock (1995) for general action-theoretical analyses of plans.

<sup>3</sup>"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.

<sup>4</sup>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.<sup>5</sup> 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.

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<sup>5</sup>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.