

WHAT IS DESIGNING?

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Literature on design methods began to appear in most industrialized countries in the nineteen fifties and sixties. Before that time it was sufficient to know that designing was what architects, engineers, industrial designers and others did in order to produce the drawings needed by their clients and by manufacturers. Now things are different. There are plenty of professional designers who doubt the procedures that they have been taught to use and plenty of new methods that have been invented to replace the traditional ones.

A common feature of both the criticisms of traditional methods and the proposals for new ones is the attempt to isolate the essence of designing and to write it down as a standard method, or recipe, that can be relied upon in all situations. Some recent definitions and descriptions of designing appear below.

Finding the right physical components of a physical structure (Alexander, 1963)

A goal-directed problem-solving activity (Archer, 1965)

Decision making, in the face of uncertainty, with high penalties for error (Asimow, 1962)

Simulating what we want to make (or do) before we make (or do) it as many times as may be necessary to feel confident in the final result (Booker, 1964)

The conditioning factor for those parts of the product which come into contact with people (Farr, 1966)

Engineering design is the use of scientific principles, technical information and imagination

in the definition of a mechanical structure, machine or system to perform prespecified functions with the maximum economy and efficiency (Fielden, 1963)

Relating product with situation to give satisfaction (Gregory, 1966)

The performing of a very complicated act (Jones, 1966a)

The optimum solution to the sum of the true needs of a particular set of circumstances (Matchett, 1968)

The imaginative jump from present facts to future possibilities (Page, 1966)

A creative activity—it involves bringing into being something new and useful that has not existed previously (Reswick, 1965).

The first surprise about these quotations is that they differ so much: only about a tenth of the important words are mentioned more than once. There seem to be as many kinds of design process as there are writers about it. Another surprise is that nobody mentions drawing, the one common action of designers of all kinds. Certainly the above quotations give little support to the idea that designing is the same under all circumstances, and, as we will see later, the methods proposed by design theorists are just as diverse as are their descriptions of the design process.

Perhaps the variety which is so obviously present in the literature on designing is a useful clue. In getting away from drawing, and from the conventional ways of thinking about design, the theorists may together have produced the very

thing that is needed to overcome the weakness of traditional designing, that 'thing' being variety itself, a greater variety than that which exists in the experience and expertise of any one designer, of any one design profession or, for that matter, of any one design theorist.

One thing that *is* common to all the above descriptions is that they refer, not to the outcome of designing, but to its ingredients. These, as we have seen, differ as much as do the ingredients in a recipe book, if not more so. If we seek a firmer basis for our thoughts we had better look outside the process itself and try to define designing by its results. A simple way of doing this is to look at the end of the chain of events that begins with the sponsor's wish and moves through the actions of designers, manufacturers, distributors and consumers to the ultimate effects of a newly designed thing upon the world at large. All one can say with certainty is that society, or the world, is not the same as it was before the new design appeared. The new design has, if successful, changed the situation in just the way that the sponsor hoped it would. If the design is unsuccessful (which in many cases is more likely) the final effect may be far from the sponsor's hopes and the designer's predictions but it is still a *change* of one kind or another. In either case we can conclude that the effect of designing is to *initiate change in man-made things*. This, for the moment at least, can be our simple but universal definition of the expanding process that formerly took place on a drawing board but now includes 'R and D', purchasing, design for production, product planning, marketing, system planning and other things besides. As soon as we think about this ultimate definition, we see that it applies not only to the work of engineers, architects and other design professionals but also to the activities of economic planners, legislators, managers, publicists, applied researchers, protestors, politicians and pressure groups who are in the business of getting products, markets, urban areas, public services, opinions, laws, and the like, to change in form and in content. What, in all this diversity, has happened to designers? Have

they, under the modern pressures to become more scientific, to participate and to coalesce, lost the special quality that distinguished them from those who do 'uncreative' work? Surely the answer is 'yes'. 'Yes' because designing is outgrowing its reliance upon the mysteries of being able to draw and of being able to foresee future situations in visual form: and 'yes' because all the *non*-designing professions have now to plan their activities on an industrial basis making use of man-machine systems wherever possible.

THE DESIGNER'S OBJECTIVES

We have seen that the traditional objective of a designer was to produce drawings for the approval of his client and for the instruction of manufacturers. Our new definition of designing as the *initiation of change in manmade things* implies that there are other objectives that must be achieved before drawings can be completed, or even started. If the object that is drawn is to bring about prescribed changes in the world at large, the designers must be able to predict the ultimate effects of their proposed design as well as specifying the actions that are needed to bring these effects about. The objectives of designing become less concerned with the product itself and more concerned with the changes that manufacturers, distributors, users, and society as a whole, are expected to make in order to adapt to, and to benefit from, the new design. [...]

The process of bringing about change in man-made things is portrayed as a series of events which starts with the supply of materials and components to a producer and ends with the evolutionary effects upon society-at-large of the system of which the new product forms a part. Each of these events is a stage in the life history of the product and each is dependent upon the one before it. Neither the sponsors of the new design nor its designers play a direct part in product life history: their control ceases before the production process starts. [...]

[...] not all sponsors are financially affected at every stage in product life. More often than not at the present time, but possibly less often in the

future, the sponsor does not lose or gain if the design has costs or benefits beyond, say, the point of purchase. Under these circumstances designers may well be aware of good or bad effects of alternative designs upon issues which are important to the people concerned but which are of no direct interest to their sponsor. In such cases the designers may be tempted to offer to the sponsor only those proposals that have 'good' effects. Designers who are tempted to do this are stepping outside their role and taking decisions on behalf of society as a whole. Those who are faced with this particular dilemma, and many are, should not be tempted to legislate by stealth but should instead persuade their sponsor to take the right decision himself. If he will not do so they can resign their positions and bring to the notice of the persons who will be affected by the new design the predictions which, as designers, they are able to make and on which the sponsor has decided not to act. An empirically minded designer might ignore the whole question of acting outside his sponsor's interests and decide to let the imperfections of the present position run their course.

This moral design dilemma is frequent today because the effects of design decisions are growing faster than are the organizations that sponsor design. Typical examples occur in, say, the designing of supersonic aircraft that can impose sonic bangs on large populations, or the planning of new cities that can drastically alter the circumstances of millions of people. The ultimate answer to the dilemma is not for designers to become as gods but for the design process to become more public so that everyone who is affected by design decisions can foresee what can be done and can influence the choices that are made. Such a change would mean that the public effects of designing become the subjects of political debate and also that some of the principles and methods that are the subject of this book become a part of general education.

WHY IS DESIGNING DIFFICULT?

[...] The fundamental problem is that designers are obliged to use current information to

predict a future state that will not come about unless their predictions are correct. The final outcome of designing has to be assumed before the means of achieving it can be explored: the designers have to work backwards in time from an assumed effect upon the world to the beginning of a chain of events that will bring the effect about. If, as is likely, the act of tracing out the intermediate steps exposes unforeseen difficulties or suggests better objectives, the pattern of the original problem may change so drastically that the designers are thrown back to square one. It is as if, during a game of chess, one could choose to switch, or be obliged to switch, to a game of snakes and ladders. This instability of the *problem* is what makes designing so much more difficult and more fascinating than it may appear to someone who has not tried it.

The task of the design team is to ensure that each of the many different things of which the sponsor must be sure [...] has two characteristics:

- (a) it is within the capacity of the suppliers, producers, distributors, etc., at each stage of product life
- (b) it is compatible with that which precedes it and that which follows.

Strong dependencies between distant points in product life history make it difficult to design without much back-tracking and circularity. The role of imagination, the designer's trump card, is to enable him to avoid incompatibility between the one stage and another by changing his original aims to others that are more compatible but equally satisfactory in the long or short run. This sensitivity of aims to detailed decisions makes it difficult or impossible to solve design problems in a wholly logical way but does not prevent their solution within the adaptable apparatus of the human brain. The purpose of this book is to explore some first attempts at permitting many brains, rather than one, to grasp, and to explore, the complexities of designing.

IS DESIGNING AN ART, A SCIENCE OR A FORM OF MATHEMATICS?

The view put forward here is that designing should not be confused with art, with science, or with mathematics. It is a hybrid activity which depends, for its successful execution, upon a proper blending of all three and is most unlikely to succeed if it is exclusively identified with any one. The main point of difference is that of *timing*. Both artists and scientists operate on the physical world as it exists in the *present* (whether it is real or symbolic), while mathematicians operate

on abstract relationships that are independent of historical *time*. Designers, on the other hand, are forever bound to treat as real that which exists only in an imagined *future* and have to specify ways in which the foreseen thing can be made to exist.

[...]

NOTE

Extracted from C. J. Jones, *Design Methods* (New York: Wiley, 1992), pp. 3–10. Reprinted with permission of John Wiley & Sons, Inc.