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which is a prerequisite for building social systems. Therefore, in contrast to currently prevalent opinion, there is no opposition between action theory and systems theory. Such an opinion can only emerge when the problem of temporalization of complexity is either not seen, or when its relevance is underestimated.

Morphogenesis and Management: Some Implications

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The main purpose of the paper will be to look at the influence of a change in perspective (namely, getting away from the input/output model) on social systems, in general, and management ones, more specifically. The implications of this change are of a critical nature for organizational design, decision-making, control and strategy. In particular, the paper will argue that the concept of the identity and wholeness of a system is central for understanding (a) how an organization can properly read its environment; (b) how firms can grow either according to a conglomerate pattern (low identity) or according to a synergetic pattern (high identity); (c) how a strategy policy can be either responsive or proactive; (d) a number of other organizational matters. The central concept of the argument will be that depending on the level of identity formation and wholeness within an organization, the behaviour of the organization will either fluctuate as a cork on turbulent waters—with a low capacity to cope with it—or will be able to maintain a certain degree of invariance within itself. The latter will enable the organization to be moderately affected by short-term disturbances in order to better cope with, adapt to and take advantage of long-term trends within the environment.

Physical sciences are highly esteemed for their methodological rigour and their unquestionable 'objectivity'. As such, they have exerted a considerable degree of influence on the 'softer' disciplines, such as the social sciences, which in their quest to raise their scientific level, have looked at physical science as the model to imitate. There are many examples of such an influence, but one of the most important ones is probably the basic principle of 'cause-and-effect' relationships which can easily and repeatedly be demonstrated with physical phenomena. This gives rise to the very familar model of input/output configurations which has been, in turn, extensively applied in engineering systems. This input/output model, widespread in physical sciences and highly applicable in engineering ones, is not an appropriate analogy for social systems, but it has nevertheless been used to a great extent. Skinner epitomizes the usage of input/output models in social sciences, looking at human behaviour in its entirety as a black box on which the only important element is inputs and outputs. Even though there has always been a consistent minority who point out the deficiencies of the input/output approach (Goldstein in *Gestalt psychology*, Festinger in *cognitive theories*, De Finetti in *decision theory*, Chomsky in *linguistics* and Boulding in *economics*) it has not made considerable in-roads into the epistemological orientation of social sciences. Lately, the minority has gained considerable support by several general systems theorists who are not at all satisfied with the input/output approach and who have started questioning the classical cybernetic type 'goal-seeking' system and its validity to be generalized to the more complex biological and social systems. These scientists have gathered a considerable amount of evidence, mainly from biological systems which tend to support their claim that the input/output models makes little sense in the light of the evidence.

The major purpose of the paper will be to look at the influence of this change in perspective (that is, getting away from the input/output model) to social systems in general and management ones more specifically. The implications of this change

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are of a critical nature for the organizational design, decision-making, control and strategy.

In particular, the paper will argue that the concept of the identity and wholeness of a system is central for understanding (a) how an organization can properly read its environment; (b) how firms can grow either according to a conglomerate pattern (low identity) or according to a synergetic pattern (high identity; (c) how a strategy policy can be either responsive or proactive; (d) a number of other organizational matters. The central concept of the argument will be that depending on the level of identity formation and wholeness within an organization, the behaviour of the organization will either fluctuate as a cork on turbulent waters—with a low capacity to cope with it—or will be able to maintain a certain degree of invariance within itself. The latter will enable the organization to be moderately affected by short-term disturbances in order to better cope with, adapt to and take advantage of long-term trends within the environment.

In conclusion, it will be argued that a change in attitude from input/output to morphogenesis has far reaching consequences for management. These consequences will have several aspects: (a) understanding the very nature of management; (b) the way in which decisions are made; (c) at the level of actual operations and (d) at the level of strategy formulation and implementation.

The Public Use of Computers—the Way Ahead

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As we move towards an increasing use of on-line interaction of the public with the computer in various walks of everyday life, a way forward is outlined which will remove the aches and pains of 'clumsy and inefficient' man-man interaction (through the utilization of a computer), while still retaining the various pleasures of man-man interaction and human contact (through the utilization of a human intermediary).

We are at an important stage in the evolution of public service systems so that the member of public now faces the prospect of interacting with the computer, in various walks of life. A critical issue concerns the method of Public-Computer interaction. Should the public be asked to interact directly with computers (*direct-interaction*), or should they interact through a human intermediary (*double-interaction*)?

The author attempts to chart the way ahead by examining various issues. It is thought quite justifiable to plan for *direct-interaction*, where:

(a) the task at hand is *simple* (quickly, easily, and readily executed);
(b) the task serves to *supplement* the execution of a similar or more complex task through double-interaction; and
(c) where the simple task serves to *complement* a more complex task executed through man-man interaction and/or double-interaction.

However, when it comes to *complex* tasks, i.e. long, not easily or readily executed (e.g. House-hunting, Citizens' Advice, Career Guidance, etc.), the prescription should involve *double-interaction*. The reasons justify this prescription are briefly that:

(a) We are still in doubt what the short- and long-term impact interacting with computers would have on the public. The intermediary could cushion this impact.