



## SECTION 2: MANAGEMENT/ORGANISATION

Second-order  
cybernetics

# Second-order cybernetics! In systemic management thinking?

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**Abstract**

**Purpose** – The following contribution tries to answer the question of whether the management theory's interpretation of cybernetics has something to do with second-order cybernetics, or in other words: what the impact of von Foerster's ideas so far on the German speaking management theory is.

**Design/methodology/approach** – Different methodological programs in business administration and management theory will be summarized to become aware of the fundamental difference between Foerster's ideas and their interpretation through the systemic approach in management theory.

**Findings** – In the beginning of the 1970s and all through the 1980s systemic thinking became what some management thinkers wanted to be called a "new paradigm" that ever since has attracted numerous researchers and practitioners, especially in the German speaking regions. So it seemed only natural that, together with systems theory, cybernetics, too, was introduced to the management discipline. Can you seriously have cybernetics without second-order cybernetics? Of course you can. The question here is: how far did German speaking systemic management thinking dare to go in incorporating cybernetics into the theory of management of social systems?

**Originality/value** – We will clearly see what Heinz von Foerster was pointing at when he talked about management being an autological concept where the manager has to take his being part of the system seriously. When making obvious different conceptual versions of cybernetics and demonstrating their corresponding attempts in transferring cybernetic thinking into the domain of social systems we might get an insight into new directions for researchers in management.

**Keywords** Cybernetics, Cognition, Management activities

**Paper type** Viewpoint

**Introduction**

Those who are familiar with the different methodological programs in business administration and management literature might say that German speaking management theory has already not only thoroughly studied but also integrated Heinz von Foerster's second-order cybernetics, so there would be no need for the discipline to update its epistemological foundation. They might also argue that this especially applies to the Swiss St Gall systemic approach, probably the most influential school of systemic thoughts in German speaking management literature.

Well, in brief, quite the opposite is the case: wherever management literature talks about cybernetics, it still breathes the conventional understanding of cybernetics as being something objective about communication and control in the animal and the machine. This applies especially to the German speaking section of the discipline, whereas for instance, cybernetic thinking in the former Soviet Union has always been said to have shown a surprising conceptual similarity to the American understanding of second-order cybernetics (Grochowiak and Kaehr, 1995).



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However, when cybernetical methods have been adopted, they have not been so far from the goals of first-order cybernetics (. . .). It was the case of strategies proposed (and used) in the management of firms, as they moved by Stafford Beer and various other authors: here, we cannot say that observing systems are always in dialectic interaction with observed systems, the latter were rather objectively defined, and control was fixed as a purposiveness for a cybernetician who himself little changed by the modifications he brought into the controlled system (Bernard-Weil, 1994).

### Cybernetic II = second-order cybernetics?

Since the St Gall systemic approach claims to have incorporated von Foerster's move from observed to observing systems it makes sense to start the analysis with its founders. Ulrich (1988) and Schwaninger (1994a) always took cybernetics as part of general systems theory that deals with steering, with keeping things under control (Plate 1).

At that point Staehle's (1991) statement about Ulrich (1984) having moved from cybernetics I to cybernetics II is no real help since Staehle, too, is missing the point here. To make the reader believe that Ulrich had reached the level of second-order cybernetics Staehle (1991) borrows a distinction Maruyama (1963) had introduced, and defines cybernetics I as focusing on stability, balance and feedback, and cybernetics II as dealing with instability, flexibility, change, learning, autonomy and self-reference. But note: Maruyama wrote his paper in 1963, in other words it seems impossible, out of plain chronological reasons, that Maruyama could have meant second-order cybernetics, and so it is with Ulrich.

His cybernetics in management thinking is about management cybernetics with well defined *objects* such as automation, integrated product planning, management information systems (Malik, 1992) and so on, not the manager himself. Gerken (1991), probably one of the most outspoken critics of the St Gall systemic approach and its naïve assumptions of manageability, called this control obsessed position that tried to make dynamics calculable "grotesque": "Society only slowly learns that reality comes into being as follows: no one's got a clue but everyone believes in it. It's us who play the game".



Plate 1.

**The more “second-order . . .” the better?**

For Schwaninger (1994b) the difference between first-order cybernetics and second-order cybernetics is mainly a logical differentiation that evolved during the transfer of cybernetic thinking into the domain of social systems. He reduces the difference basically to “externally guided” versus “self guided”. “In second-order cybernetics the controller (manager) is part of the system. The system is goal oriented and consists of subsystems that pursue their own goals” (Schwaninger, 1994b).

At first sight this perspective might seem quite close to Heinz von Foerster’s ideas. But Schwaninger (1994b) not only insists on the separation of the guiding entity and the guided entity and views effective steering of a system only possible, if the manager maintains sufficient distance and observes the systems from the outside. He also suggests what he calls “second-order management systems”, which, besides internal coordination should primarily deal with the harmonization of the system with its environment (Schwaninger, 1994a) (Plate 2).

Moreover, a distinction between first-order change and second-order change is introduced, which is also quite questionable since second-order change is not conceptualized as a re-entry in the Spencer Brown’s sense but simply as some deeper, more sustainable *meta* change (Espejo *et al.*, 1996). An inflationary use of the fashionable phrase of “second-order . . .”, you could say. But none of these applications of the term were able to close the loop.

Von Foerster’s ideas had obviously inspired Schwaninger *et al.*, but distinctly different from them, von Foerster had pointed at “management” as a *second-order term*, as an autological term. Because for von Foerster the specialty about management, its autological structure, did not become apparent, unless the manager took his being part of the system seriously, from an epistemological point of view:

I wish to contemplate the manager who considers himself a member of the organization he manages. If he takes this consideration seriously, *he has to apply his managerial perceptions and acts to himself, to his own perceptions and acts*. Management, clearly, is an autological concept (von Foerster, 1984).

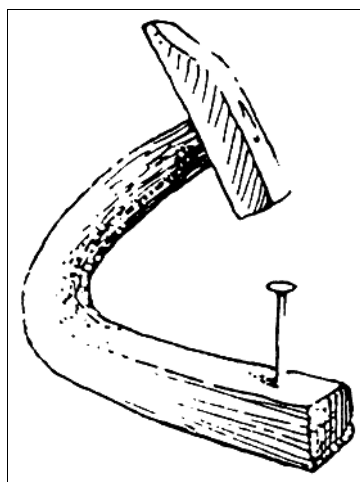


Plate 2.

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34,3/4**Back to Popper**

For Malik (1992, 1993), another prominent and fairly influential representative of the systemic approach in management, the question whether and to what degree a system could be kept under control strongly depends on the characteristics of the involved systems: the one that shall be brought under control and the one that has to control. His conceptual version of cybernetics is basically a quotation of Stafford Beer "...the philosopher of the organizational and the wizard of management" (Foerster, 1993) and his viable system model (VSM).

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Concerning the challenges management has to meet, he admits that "... discovering reality is a problem more difficult than generally thought, primarily because brains have the ability to construct different realities, which each can be consistent, so that it becomes difficult to see, which one is the better" (Malik, 1984). But don't let his statement fool you. This is not constructivism. Malik is not a constructivist, on the contrary. He later stressed his strong belief in realism and his connection to the epistemology of Popper. "I am still of the opinion, that – properly understood – Popper's philosophy and epistemology is an essential basis for the practice of management of social institutions" (Malik, 1992).

**Via holistic thinking towards second-order cybernetics?**

Together with the systemic approach the so-called holistic thinking became quite fashionable in the 1980s (Ulrich and Probst, 1988). "In search of a new paradigm" (Ulrich and Probst, 1988), quoting Heisenberg's groundbreaking findings in physics as a somewhat new direction for researchers in management, Foerster's second-order cybernetics is also mentioned:

The fact that the double nature of the electron cannot be observed simultaneously leads to the limits of what is observable in principle and to the insight, that the observer is part of the world he observes, that any observation indeed creates the phenomenon which is observed (Ulrich and Probst, 1988).

Well, you can hardly get any closer to second-order cybernetics and the re-entry of the observer, can you? And von Foerster (1984) had even been to St Gall, where the Swiss systemic thinkers had invited him to a conference on "management and self organization in social systems". And hopes were high that he might have a strong impact on management research. But when you read on the above quoted literature about Ulrich and Probst's (1988) holistic concept you will immediately notice that their thinking is still strongly connected with classic cybernetics.

**Conclusion: second-order cybernetics as a purely rhetorical update**

Summarizing the concept of the systemic approach in management research and theory, as mainly driven by the St Gall systemic approach, is a little disappointing since it seems that, wherever the discipline talks about second-order cybernetics it is a rhetorical, semantical update rather than a radical conceptual change in the underlying epistemological assumptions.

I will briefly illustrate the fundamental difference between Foerster's ideas and their interpretation through the systemic approach in management theory. Compare Escher's "picture gallery" with one of his other drawings, the "three orbs II".

The "Picture gallery" only shows that the observer is embedded in the drawing he looks at. But who made the drawing of the picture with the city at the sea, the picture

that embeds the observer? He himself? One cannot tell. The “three orbs II” on the contrary depicts the moment of its own recursive process of coming into being. The middle orb mirrors an observer (Escher), who – on a piece of paper – had sketched three orbs by drawing (three) distinctions (as Spencer Brown’s laws of forms command any observer to do). In just that moment that is depicted by “three orbs II” you can see that, once the picture is finished, the middle orb will show an observer, who – on a piece of paper – had sketched three orbs by drawing (three) distinctions. . . and so on.

Foerster’s message is to be found in the middle orb. Unlike “picture gallery” the drawing does not only contain itself and its observer. It also contains its *creator* (!) and shows how he constructs the work that is contained in him (in his mind) and that contains him, by drawing distinctions. Some thousand years ago, the Irish monk Eriugena had already pointed at the crucial moment when the loop is closed.:

For just as the wise artist produces his art from himself in himself and foresees in it the things he has to make ( . . . ) so the intellect brought forth from itself and in itself its reason, in which it foreknows and causally pre-creates all things it desires to make (Eriugena in Moran 1985).

Needless to say that Eriugena’s writing was quickly put on the Vatican’s index of dangerous and therefore forbidden books.

Now we clearly see what Foerster was pointing at when he talked about management being an autological concept where the manager has to take his being part of the system seriously, from an epistemological point of view, and has to apply his managerial perceptions and acts to *himself, to his own perceptions and acts*.

But we always see equally clear that – in contrary to Foerster – in systems approach in management theory the observer maintains his privileged extramundane position of a super observer. The interpretation of cybernetics by the systems approach does not provide a fully reflexive conceptualization of the observer just as “three orbs II” mirrors the creator (Escher or any manager) back into the very heart of his creation. Cybernetic management thinking still believes in its discoveries “. . . that some company – let’s say IBM – shows certain characteristics and behavior that make up its special identity” (Ulrich and Probst, 1988) and that they could be objectively identified. But, at the end of the day, one would have to concede that of course it was not cybernetics’s fault that it had become such an integral part of the systemic approach from the very beginning and that management thinking so far did not get Foerster right. It has more to do with the fact that management theory consequently ignored Spencer Brown’s laws of form and Foerster’s hints in that direction, but that again is a different story. The concept of re-entry within the laws of form would open the view towards a proper understanding of second-order cybernetics.

Today the word [cybernetics] has returned to common use, but its meaning and importance are not understood (Pangaro, 1991).

So there is a lot of work left to be done if we want Foerster’s ideas to stay alive and become an integral part of management thinking, call it systemic or whatever, beyond all these fashionable “second-order” . . . management models and concepts.

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