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Self-organization as a New Paradigm in Management Science?

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Abstract

The paradigm of self-organization (SO) provides an attractive chance for the development of new ideas in management theory and practice. Thus, the current management debate is driven by at least two, partially contradicting, approaches to handle the "phenomenon" of SO:

1. SO seen as an empirical (and "practical") phenomenon.
   In this case SO indicates the "self-steering" potential of organizations. From this point of view, the management task can be defined as "controlling" this potential. Facing turbulent environments, this position may lead to new "balances" between formal structuring and self-organizing.
2. SO seen as a (not very "practical") scientific paradigm.
   The question here is: Can we explore the above mentioned problems by using SO theories and do they give us some help to find "best balances"? No, they do not! From the paradigmatic point of view SO shows "the way how organizations work". There is neither a balance nor a contradiction between "self" and "formal". The system is "self", and therefore "formal" has to be something different. The paradigm does not address our problems.

Consequently, we have three options: re-defining our problem, looking for a "better" paradigm or trying to find a "third way".
Current management approaches seem to be undecided between option one and option three.
Our article outlines some recommendations for this decision by addressing the following focal points:

1. Clearing the "positions" within the current management debate on SO.
2. Exemplifying problems that could occur when applying the SO paradigm in a strict sense to management theory.
3. Attributing these problems to "principles" to construct a theory in management.
4. Sketching proposals for a "partial inclusion" of management and SO.

Introduction

The attractiveness of SO in the management community roots in practical deficiencies rather than in an (academic) fascination for the new scientific paradigm. As we shall see later, this is one of the most important reasons for confusions within the current debate.

To the management community (academics **and** practitioners), helplessly strolling in a world of turbulent changes, unable to control them, SO "must" seem like a bright figure silhouetted against this menacing background. Why worry? Can't we just lean back, arms crossed, and let SO do the job, a cynic might ask. Too much "poetry"? Just have a look at some of the articles on SO. Certainly, you will find several in close contact with "(auto-)poietic" theory.

If the problem of today's organizations is to become Òunmanageable because of their management" (Mintzberg 1979), is SO indeed the right "cure" for this problem? If so, how does it work? Or, in other words, what is the relation between management and SO?

- Will organizations become "self-organized" **instead** of "being managed"?
  or
- Will organizations become "manageable" **because** of "SO"?

The management community today prefers the second type of relation (well knowing that the first one would lead to its own redundancy at the end).

But, choosing the second alternative, also leads to a battery of succeeding questions. And that is where trouble begins. Some of the main difficulties may be described by the following questions:

- How can traditional ideas of management - circumscribed by searching for "the best way" and/or "getting things done" through planning and intervening - be combined with the occurrence of self-organizing processes?
  Do we have to create a "surprise-management" or even a "management by chance"?
- How can we most efficiently use the steering-potentials of self-organizing processes?

- How can we prevent self-organizing processes from producing "countereffective results"?
  Who may define what "counter" means?
- What are the new functions of management?
  What are helpful steering activities?
  What is the role of managers - do they only have a support function?
  Is management (function and people) part of the self-organizing game, outside the game, or even both?
- What could be an appropriate "theory of action" behind "management and SO"?

Toward an understanding of "self-organization"

Let us start with a story. Imagine students who learn how to surf. The teacher stands at the beach, a megaphone in his hand, and tells the students what they have to do, exactly describing every single move that is necessary to hold the balance. The students, willing to learn, try to follow each of his words. Suddenly the weather turns: storm, dangerous waves. No chance for detailed intervention. The teacher shouts: "Hey, forget what I have told you, just try to stay alive!"
The same situation may happen when you are a leader of a company "in turbulent days". No chance to get the men and women in trouble in. You cannot be everywhere at the same time and perhaps you even cannot swim (which may be one of the most serious problems of supervisors in postmodern times). So, what can you do? You can call a professional trouble-shooter ("crash-manager"). But most of the time this will be too late. When he does finally arrive, you can be sure that he will save many of the boards but

few of the people.
So, what is "the morale of this story"? In our opinion, there are at least two of them:

- Turbulent days need different teachers (managers) who are able to activate "self-management potentials".
- You cannot teach anything. You can only help people to find (learn) it by themselves.

The first "morale" reflects the opinion that SO may activate undiscovered "steering-potentials" that cannot be substituted by formal structuring. They, in turn may, result in more complex management capacities, helping an organization to handle complex environmental demands. In this case, SO is used in an empirical and/or functional manner.

The second "morale" is based on SO as the guiding principle of "how organizations work". In our case: learning always means "self-learning". This is the "paradigmatic" meaning of SO.

Both understandings of SO are - as we will show - continuously mixed up in the current debate about "management and SO". In order to make a clear line (and to show, when which understanding is used) we will differentiate from now on between SO "type 1" (standing for relative autonomy of action) and SO "type 2" (standing for autopoiesis, i.e. general operating principles of social systems).

SO "type 1" (relative autonomy of action)
SO in this sense is included in almost every single theoretical perspective (of management).

- From a tayloristic point of view, SO is the reason for poor productivity and pauperization and can be mastered by consequent "scientific management".
- From a bureaucratic point of view, SO is an expression of "arbitrary rule" or, any way of a Ònon-legal form of dominationÒ and stands in contrast to the "bureaucratic ideal type" (Weber 1921/1972).
- The human-relations-movement regards SO as the "informal" component that is inevitably inherent in any organization, searching for possibilities to "integrate the individual and the organization" (Argyris 1962) by means of an improvement of the quality of work-life and by offering opportunities for intrinsic motivation (Herzberg 1982, Maslow 1977).
- From a conceptional point of view, addressing "power and (micro-)politics in organizations" (c.f. Crozier & Friedberg 1993), SO is manifested in the political games of individual actors.

- In terms of "methodological individualism", SO can be described as emerging, non-intended effects aggregation caused by the collective and individual actors' actions within an institutionalized context (Boudon 1977).

Current discussions in the management community still seem to be - to a large extent - guided by the human-relations-model. However, with changed objectives and a much more complex argumentation, due to a heuristic utilization of the SO paradigm. Instead of integration efforts, motivation efforts, and humanization efforts, gains regarding steering-complexity, flexibility and innovation through SO are nowadays focal. Motivation and autonomy of action remain in discussion, but become less important. The individual is "pushed back", the organization as a "holistic entity" steps into the foreground. The systems-

theoretical concept of organization is used as a metaphor. It creates an image of the entity to be steered, providing a tool for interpretation. However, **without** obeying to all implications encompassing these theories.

SO "type 2" (autopoiesis, i.e. general operating principles of social systems).
Using the SO concept in a strictly paradigmatic way, the above stated definitions do not make sense. Questions concerning a gradual extension and improvement of SO capabilities (for which reason whatsoever) are out of discussion, because the whole organization is seen as an "autopoietic system". Per definition, organizations "organize themselves". All the above mentioned antinomies between instruction and autonomy, between formal and informal, between "rules of the game" and the game itself are nothing but different options of a self-organizing social entity. The paradigm of SO is a meta-perspective describing the "autopoietic operating principles" of organizations. In this view SO refers to self-genesis, autopoiesis, of social systems.
The above developed understanding of SO "type 1" can at best be heuristically or associatively integrated. When trying to find points of contact between the empirically-functional and the paradigmatic understanding of SO, just differences with regard to quality or level of communication and decision-processes within SO come into mind. One could, for example, differentiate between directing and consensual communications (communication understood as the basic element of autopoietic social

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systems) and interpret both as qualitatively different varieties of SO. Such differentiation however, are not a topic within the "formalistic" mainstream discussions about the SO-paradigm.

Concepts of "management" within the different SO-"types"

At least implicitly, these different understandings of SO involve different understandings of management. Relating them to the different SO concepts shall be the subject of the subsequent chapter. Therefore, we have to differentiate between two basic understandings of management:

Management "type 1" (planning and intervening, "the master's voice")
Management is based on a plan of some "strived for" reality, concentrating on interventions to put this plan into reality. In this sense, management means "planning" and plan-based "intervention". Reality only serves to fill the plan with life ("enacting"). Disturbances are fought by "purposeful intervention" (e.g. leadership).

In its purest form we encounter this understanding of management in theories of bureaucracy as well as in the scientific management theory. "Better informed" (because knowing about problems of implementation) variations of this concept are today

- Controlling ("figures and facts")
- OD ("bubbles and clouds")

as well as mixtures of both (e.g. "soft-controlling").

In our opinion, approaches of a functionally arguing "culture-oriented" management science can be subsumed in this group (this is legitimate, because most of these approaches assume some sort of influence on the culture itself, as well as an influence of the culture on management). Therefore, modern approaches have to be subsumed under the management "type 1"-group, however already positioned at an advanced stage of "single-loop learning" (Argyris & Schön 1978). In these approaches, management is still the task of the ÒtopÒ outside the bureaucratic system (new public management) or of some "omniscient engineer" ("business re-engineering"), enriched by aspects of "cultivation" and "sense-making".

The "dirty part of the job" (e.g. "downsizing"), however, is more and more delegated to SO (e.g. establishing lean management through quality circles that are, in turn, redundant at the end). Instruments, tools and objectives (productivity-rates, desired scope of downsizing) of these "two-sided" strategies are large-scaled "change-programs" which are "educated intoÒ the organizations with huge efforts. Transferring the "bonmot" of the seventies that the introduction of cooperative leadership can be regarded as the "ultimate authoritarian act" to the nineties, the adapted witticism may read as follows: "the ultimate act of formal structuring is the introduction of SO".

The "plan-fulfilling machine" turns into a "learn-and-change-machine". Yet, the organization itself has still "no freedom to choose". SO is only included in a "tamed" version. As a result, modern perspectives and practical design concepts of management (although including SO) still stick to the ideal of management "type 1".

Management "type 2" ("emerging" self-steering)
From the perspective of the SO paradigm, an opposite ideal of management can be deducted. Management itself has to be understood as a core element of SO.

In this sense, management itself is "self-organizing". It is a subset of SO processes which has to be defined. In other words, some of the communications (decisions), which constitute the autopoietic social system, (organization), have to be understood as management communications (management decisions). The management of an organization then is the result of self-organizing processes, if it is brought forth by a 'sense-delimited' communication-context (Luhmann 1984). As long as those who are creating the structure and those who are concerned with the structure represent the same system, the premises of SO are fulfilled. In this case, the organization itself is fully responsible for its management because it is its own creation. Management **is** communication and is caused by communication; it **is** decision and is caused by decisions; it is, in this sense, relating to the core elements of the autopoiesis of social systems/organizations.

The specific "sense" that could differentiate management processes from other self-organizing processes, can also only be produced by the system itself. From this point of view (closely related to the "radical constructivism") the only possible definition of management would be: "management is what an organization ascribes management to be".

To simplify the above, one can assume the following "self-construction" of "management reality": management consists of all communications and decisions relating to the "self"-steering of an organization. Assuming further that every decision in some way implies, or at least, intends a "steering"-impulse, one could conclude that SO and "self-management" are identical.

Clearing the "positions" within the SO debate

Now, let us link the different SO-"types" and the management-"types" developed above in a typical "4-fields-table" and let us examine where to position (and with which consequences) representatives of the idea of SO within management science. Needless to say that this effort necessarily involves subjective conclusions and interpretations.
Now let's have a look at the positions of the 4 concepts of SO and management that we chose to exemplify in our matrix:

	SO "type I" theory of action oriented approach "autonomy of action" on a group or individual level	**SO "type II"** systems theory oriented approach "autopoiesis", operating principle of organizations
management "type I" planning & intervention "the master's voice"	**1** management as: • development and controlling of "self-steering" potentials and activities • compatible to most of the "modern management labels" e.g. zu Knyphausen (flic-flac), Probst ("material organization", heuristic design)	**2** management as: • context-design. e.g. Wollnik • re-"labeling" of "traditional management approaches" e.g. Probst, zu Knyphausen
management "type II" "self-steering" potentials and processes "no master, no voice"	**3** management as: • different qualities, contents of self-organizing processes, e.g. different forms of communication, decisions (not discussed in the SO-paradigm)	**4** management as: • part/specific quality of SO-processes • self-steering within self-organization • management by surprise/ by chance e.g. Kasper

Field 1
Management as planning & SO as relative autonomy of action
We believe that this box offers the best platform for a discussion of the SO phenomenon within management science, because the "traditional" understanding of management does not have to be totally changed. At the same time, discussions taking place in this box can be seen as a good opportunity for a remarkable enlargement of the traditional understanding of management, thereby leading to a better "fit" with regard to current

problems of management practice by first-order-improvements. As indicated above, we would place in this box tayloristic as well as culture-oriented management concepts, as long as they take SO phenomena into account. The "largest enlargement" within this box would be marked by a management concept analogue to the "superleader-ship" concept (Manz & Sims 1989): "Managing others to manage themselves".
We are convinced that the initial question "formal" **versus** "self" (underlying our discussion-group), as well as all deducted problems of a "management **of** SO" are best be discussed in this field.

Almost every single piece of modern management practice literature has to be put in this field and even scientific approaches do not function without "visits" to this box (i.e. zu Knyphausens "flic-flac"-management as an "arena" of SO; but also the "material organization" of Probst, etc.).
Unfortunately this - per se - so "fertile field" has one major disadvantage. It cannot be cultivated theoretically by using the SO paradigm. The questions imposed by the combination of management as planning & SO as relative autonomy of action will certainly not be answered by the SO paradigm. The use of the paradigm in this case is restricted to an interpretative tool and a heuristic design.

Field 2
Management as planning & SO as autopoiesis
In this case we have to further differentiate between management as an activity outside the system (1) or management as an activity within the system (2).

1. Regarding management as an activity outside the system, its function can only be interpreted as "context design" (c.f. Willke 1987, 1994). In this case, management would be a steering-effort from outside the system. Or better, a steering-intention, an offer to the organization to "improve" communications and decisions. In our opinion, this is a rather poor conceptualization of management that, in addition, does not take into account the nature of the "self-management-processes" in the system itself.

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2. With the help of a little "trick", i.e. through an appropriate definition of "the system", one can however incorporate formal structuring to represent one element of SO.
   The "formal structure" of an organization has to be understood as the result of a SO process, if it is brought forth by a sense-delimited communication context.

But this "trick" has the great disadvantage that it would lead to almost no consequences in our traditional understanding of management. All we had to do would be to affix the syllable "self-" to our current knowledge or concepts about leadership, organization, planning, strategy etc., i.e. giving them a new "label", but leaving the rest unchanged. Besides that, choosing this way would have the disadvantage of neither meeting exactly the intentions of management science (when talking about SO) nor addressing the implications of SO paradigm itself. Nevertheless, we see that this constellation is underlying some of the current SO concepts within management science. This is observable when authors speak of organizations as self-organizing systems on the one hand but continue to work with familiar management knowledge (e.g. methods, instruments and tools) on the other hand, without even considering their new position within the new paradigm.

It is obvious to us that going this way may perhaps lead to some new steering-heuristics (obeying self-steering-potentials), but cannot lead to theoretical innovations.

Field 3
Management as SO & SO as relative autonomy of action
As far as we can see, there are no discussions taking place in this box. Obviously, this combination cannot contribute a lot of answers to current questions. Above that, it is evident that considering management as being completely self-organized, while the organization is not, would lead management itself ad absurdum.
One could only imagine to differentiate for example between authoritarian and cooperative ways of communication (decision-making), thereby grasping different managerial qualities of SO. Hence, we would use the same "trick" as before, this time however on the other side of the table.

Field 4
Management as SO & SO as autopoiesis
If a paradigm shift were to take place, it would have to be observed in this field. Management would have to be conceptualized as the "self-steering" in and of a self-organizing system, by means of a specific quality of communication. Due to the fact that within the SO paradigm (respectively within the theory of autopoietic social systems) the content of communications is - conceptually - irrelevant, one has to be "tricky" again. Without "feeding" topics (communication contents), which we regard as typical for management, from outside into the theory, how could we know about what to communicate, and how could we even know what we mean when talking about "management". According to the theory, however, this can in principle only take place within the system ("sense as emerging through the system's operations").

On this track, we encounter for example Kasper. He ascribes management (he only talks of "leadership") the task to "increase the self-steering-capacity of the system" (Kasper 1990:391).[1] At the same time, leadership to him is always necessarily an element of the system itself. Using the systems theoretical code, management in this terminology has to be understood as "reflexivity" (that means a kind of systemic "meta-communication"). Yet, filling this reflexivity with content, is only possible through sporadic "visits" in field 1 (i.e. leaving for a short time the SO paradigm).

The approaches that we analyzed can be classified according to the above table as follows:

1. Probst clearly refers to our SO "type 2"**,** when he describes "order in complex systems ... as the result of linked interactive processes of a self-referential, closed network" (1987:85) and further assumes that systems "[have] specific environments, [representing] operational closed networks of output-production and [are as such] self-controlled". (1987:142) (**field 4**). Owing to the "principle of autonomy" (1987:141), management can only mean designing contexts (management "type 1"), or in Probst's own words

1. "to create a context that allows a system to find and experience its own formation. This requires a minimum of rules and not a maximum of regulations and procedures." (1987:141) What is necessary, is to "provide a zone that determines the borderlines for possible action and bears orientation." (**field 2**). When Probst, at a different place, says that the "task of an organizer within social systems ... [should be] the creation and renewal of contexts" (1988:113), he must refer to subsystems of the organization, since context-creation is an activity which is, by definition, an activity taking place "outside" the system, i.e. in the "con"text. The activity of an organizer, i.e. the process of organizing, consequently means to "consciously and creatively design, implement and control" (1987:68). Material and symbolic organizing (1987:68, 91ff) is therefore to be understood as imposed organizing [*in German: Fremdorganisation*] (**field 1**).
   On the other hand, Probst seems to use a different reference to the system. When talking about "internally generated designing and organizing to be part of a self-organized system" (1987:68) and "order to be the result of self-organization, which in social systems includes the intentional design of structures" (1987:84), Probst considers management as part of the self-organization (**field 4**).
   In addition, Probst intends to use the SO concept as a heuristic system, " because 'self-Organization' is a concept or a frame of thinking which is simply matching better in dealing with social systems" (1987:14). Consequently, it is the task of the organizer "[to] raise the degrees of freedom, respectively the number of options, and [to] increase the potentials for self-realization

and innovation on behalf of all participants" (1987:113) (**field 1**).

2. zu Knyphausen understands organizations, when seen from an internal perspective, as self-organizing conceptualizing them as autopoietic communication systems (1988:267ff) (SO "type II"), however modifying the systems theoretical approach of Luhmann.
   From an external point of view, he, in contrast, favors the position of a methodological individualism, understanding organizations as "associations of individuals or ... as a group, as an organization ..." (1988:245). From an outside perspective, "the system appears to be 'allopoietic' and externally-organized; the decision-maker considers himself (and is seen) as a decision-maker, as an acting subject, playing with the organization as if it were a

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1. machine, modeling the system according to an input/output-scheme" (1988:269). (imposed organization - extreme version of **field 1**) Only from this outside perspective "alternatives to self-organization are to be conceived, while from an inside perspective, the system can be understood by definition as a self-organizing system" (1988:309). "It is only through this 'to and fro' between inside and outside perspective that 'self-organization' as a concept is constituted ..." (1988:270).
   Leadership (imposed organization) has for zu Knyphausen a "twofold significance: affecting different contexts on the one hand [**field 2**] and admission [**field 1**] of self-organizing processes on the other" (1988:325). In this case, admission means that "a certain arena has to be defined, within which 'self-organization' can happen. Self-organization *because of* imposed organization ... particularly when assuming that self-organizing processes may lead to hierarchical structures one has to suppose that imposed organization has to intervene again and again to break up hierarchical stiffenings" (1988:309) (**field 1**).

3. Referring to Luhmann, Kasper understands organizations as autopoietic communication systems. Within his 'innovation management' approach, "self-organizing processes are the central processes for the change of expectation structures" (1990:339) (SO "type 2" **field 4**). As "leadership ... [belongs to] the self-steering of a self-referential social system, the steering of a self-referential social systems is always self-steering" (1990:390).
   Following Willke (1987) and Wimmer (1989), Kasper concludes that "priority has to be laid on an increase of the self-steering capability of the system in order to maintain the problem-solving ability of the social system" (1990:391). Only by building up and utilizing reflective capacities "on the basis of mutual reflective possibilities - on the management's understanding as well as on the system's side *understanding*, an option between one-sided control and complete self-organization is possible" (1990:391). One way to build up reflective capacities within the system, according to Kasper, are information processing activities (1990:392).
4. Wollnik utilizes the systems-theoretical approach of Luhmann, too, conceptualizing organizations as autopoietic decision systems that are divided hierarchically and functionally in subsystems, which again are understood as self-referential decision systems (SO "type 2"). The manager is

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1. simultaneously involved in several autopoietic systems, in whose decision-processes he participates. Thus, management means self-steering within self-organization (**field 4**), because "the manager is committed to the autopoietic organization" (Wollnik 1994:141).
   On the other hand, the manager functions - with regard to the implementation of decision-

processes and interpretation tendencies - as guiding figure, supervisor and corrector. He operates as gatekeeper, as translator of outside influences to the system. He directs and confines the incremental changes of the structure, of which the system is capable" (1994:141).
The manager's possibilities of influence are, according to Wollnik, restricted to context-steering (**field 2**), which he describes as an impulse to self-diagnosis, as a stimulation to reflection and as a mediation of contingency experience (1994:142ff).

Conclusions

1. At the current stage of the discussion, we are confronted with an apparently paradoxical situation: The only possibility for management theory to profit from the SO paradigm seems to consist in partially abandon it again. This can happen in two ways:
    - In all management approaches on SO, including the paradigmatic one, the empirical/functional concept of SO is implicitly - however constitutively - existent. It is the latter one which provides the legitimization for talking and theorizing about management and steering.
    - The traditional understanding of management ("type 1") is partially re-imported to define management on a content level and not only on a formal (e.g. reflexivity) level.
2. This re-import of arguments from outside the paradigm is to be observed in all approaches that we have analyzed (Kasper 1990, zu Knyphausen 1988, Probst 1987, Wollnik 1994). However, that leads to assertions which are not compatible with the SO paradigm in a strict sense:

    - SO needs "imposed organization" (zu Knyphausen 1988).
    - The task of an organizer is the creation of contexts that increase autonomy levels (Probst 1987).
4. The price which has to be paid for the partial "abandonment" of the SO paradigm is a loss of theoretical stringency. The following examples shall illustrate where the price has been paid already:
    - Probst's intention is to build a pre-theoretical frame of reference and to use SO "type 2" as a heuristic tool (Probst 1987:11ff). In doing so, he holds the door open to management "type 1" as well as using the empirical SO concept. This gives him the opportunity to develop heuristics for a SO-"phile" management. However, within this frame of reference, he cannot solve theoretical inconsistencies. And he does not aim to solve them within a pre-theoretical frame. It is at least questionable if this demand can be imposed at all on a frame of reference of this kind.
    - zu Knyphausen in contrast defines leadership as "planned evolution" oscillating in some kind of "flic-flac" between planning and pure evolution. He does, however, not attempt to conceptually integrate both in some sort of a "super-theory", that would deserve the title "management theory".
5. Those who commit themselves closer to the SO paradigm (e.g. Kasper, Wollnik 1994) have to pay different prices:
    - It becomes more and more difficult to define a distinct function and role of management in a self-organizing organization. The more consequently they withdraw from the traditional understanding of management "type 1", the more they have to exclude topics that are relevant for practitioners, but not "existent" within the SO paradigm (e.g. leading and motivating employees).
      Management within the organization can only be discussed by using "tricks". Management understood as "only" being able to set appropriate contexts on the other hand suggests a level of "helplessness", that is contradicted by some of the empirical experience. (One might argue that management is perhaps indeed "helpless" when it comes to create and put

- into practice "good" solutions for problems. Yet, in reality there is no way to escape the ÒpowerfulhelplessnessÒ of management.)

Concluding, we see the management theoretical disclosure of the SO phenomenon to be situated in some sort of "nirvana", making either "deductive" or "inspirative" use of the SO paradigm. And, strange but true, management science seems to feel rather comfortable with this situation.

How to escape this dilemma

Are there alternative ways for a more consequent application of the SO paradigm in management science? There are some that we would like to outline:

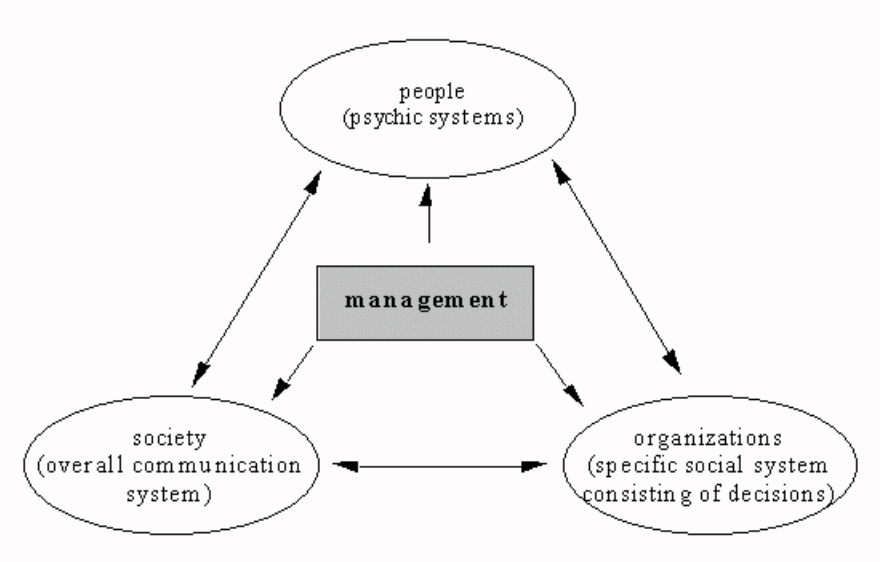
1. As shown above, the shortest, and also most appropriate way, may be seen in the concept of "context-design". Management would then be a dimension outside the system. Its core task would consist of a translation of the environmental "noise" into a code compatible to the system in order to offer a trigger for changes of communication within the organization.

   A system-internal "interface" (management as a subset of SO) is hardly to be constructed without hurting the "formal elegance" of the paradigm (necessity of "trickiness").

   In order to be able to realize and handle context-design in a consequent manner, we would need definitions at the system in close correspondence to the paradigm. The system enterprise (which is usually determined "physically" or by "law and order" by the management community) would have to be defined as a "sense-producing and sense-produced communication system". An empirical reconstruction of such systems by use of familiar research methods would hardly be imaginable, and, from a technical point of view, certainly be extremely difficult (e.g. by large-scaled network analysis and cognitive maps.)

   Plus, one should not forget that this kind of context-steering would only address one particular object of management: the management **of**

2. organizations. What about the people, i.e. the "employees" in whose "steering" a great deal of "management-intelligence" has been invested so far? What about the steering of inter-organizational and inter-systemic relations that also represent a relevant job of management? There is no doubt that with some efforts, the list can be included in the systems-theoretical "concept-universe". Isn't this what is meant by talking about "chances and risks" of systems theory? Yet, we are convinced, that in the specific case of management science this way would in any case remain a "walk on the edge" between paradigmatic purism and pragmatic usefulness.
3. In order keeping theoretical stringency and nevertheless trying to preserve the variety of management topics, the following "road" would open up:
   Management would have to be conceptualized as some sort of "super-system" which is able to communicate in different system-codes, thereby representing some sort of "interface-management" between the different types of systems:



Working out such a conceptualization seems to be daring and perhaps too early, because the corresponding conceptual basis, regarding the relationships between those systems, have - at least to our knowledge - not yet been clarified by systems theory itself.

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It would be near at hand now to suppose that our opinion is made up and that we suggest, management science (due to the delineated incompatibilities) should better turn to other paradigms and/or theories. One more reason being that the "field 1" of our table seems to contain quite a number of equivalent (management) theoretical perspectives.
But this is not our intention. We are not at the end of our trip, yet. Within the remaining distance we would like to point out some possibilities to bring together the (apparently) incompatible, i.e. to search for "partial inclusions" of management science and the SO paradigm.

The following reasons motivate us to continue this trip:

Dividing the following transfer strategies of paradigms in mid-range and short-range concepts

- application (strict "top-down" deduction)
- interpretation (associative and heuristic operationalization of paradigms from "bottom to top"),

one can detect the following pattern to be characteristic for management science:

Regarding strict application, management science ever since suffers from "phobia about paradigm" (not even the bureaucratic paradigm has been consequently translated into management concepts). Therefore, one can conclude that management science as a "science" with a high commitment toward applicability, naturally "must" have problems with any strict application of a paradigm.

At the interpretative level, paradigms are essential for management science, because without paradigmatic orientation it would lack any guidance to build up an integrative understanding of "steering" across its different fields of activity (e.g. personal and structural, strategy).
It is obvious that the idea of SO is extremely well apt to guide this integration. The number and variety of management concepts to be found in "field 1" paradoxically provides the evidence for this statement. Besides that, alternatives are not to be seen. Neither the planning paradigm of management

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science, nor the actors paradigm of organizational research are able (and intend) to adequately work out the "phenomenon of SO".

In order to be able to discuss a meaningful and useful "partial inclusion" (interpretative use), i.e. to stress the "overlaps", it is however necessary to emphasize the differences and/or incompatibilities. The latter does not take place very often in the current discussion and is, in addition to the unclear use of the SO concept, certainly the second major cause for the confusion in the current debate which we have described at the beginning of this paper.

SO-Paradigm and Management Science: Some Conceptual Differences

In our understanding the differences originate in the different "basic concerns" of the SO paradigm and of management science. The following table tries to clarify the differences and their origins.

	management theory	**systems theory**
central problem	solution of practical problems aiming at proactive design	development of a semantic system, a consistent and closed system of concepts evolutionary "Eigen"-logic
system-definition	limited by "law and order" or "physical" shape multi-dimensional thinking	self-limitation by sense reduction of complexity
steering	external-steering or self-steering on the basis of external-steering	self-steering
elements	entities	instable elements continuously reproducing themselves in order to constitute system-environment differences
value-orientation	acknowledgment of values	systems rationality

Trying to simplify our findings, one could argue that, while the SO paradigm is searching for a "world-formula", management science is on a "theory-guided" search for empirically valid and practically useful steering knowledge - quite a difference regarding the abstraction-level and the "self-set" objectives.

Depending on their different objectives, the criteria for a possible evaluation of success or failure have to

be different. The ÒkillingÒ argument against the SO paradigm would be the proof of a formally logical inconsistency within its categories. With regard to management science, it would be the failure of the offered success formula, respectively their methods and tools (although one has to be aware that success cannot be defined purely economically but has to be defined under consideration of social desirability, "trendiness", etc.)

In the area of "popular" literature on management, one can currently very well observe how possible failures are prophylactically outmaneuvered by "clever" marketing strategies. The strategy is to shorten product-life cycles and try to place a great variety of "labels" of little transparency on the market: from "lean" to "learn" to "lean-learn" to "intelligent" to "neurotic" to "re-engineered" to "fractal" to "virtual" to "chaotic" - and back again. The consumer makes big eyes and consumes - in the way one consumes hamburgers at McDonalds - quick and without any culinaric expectations.

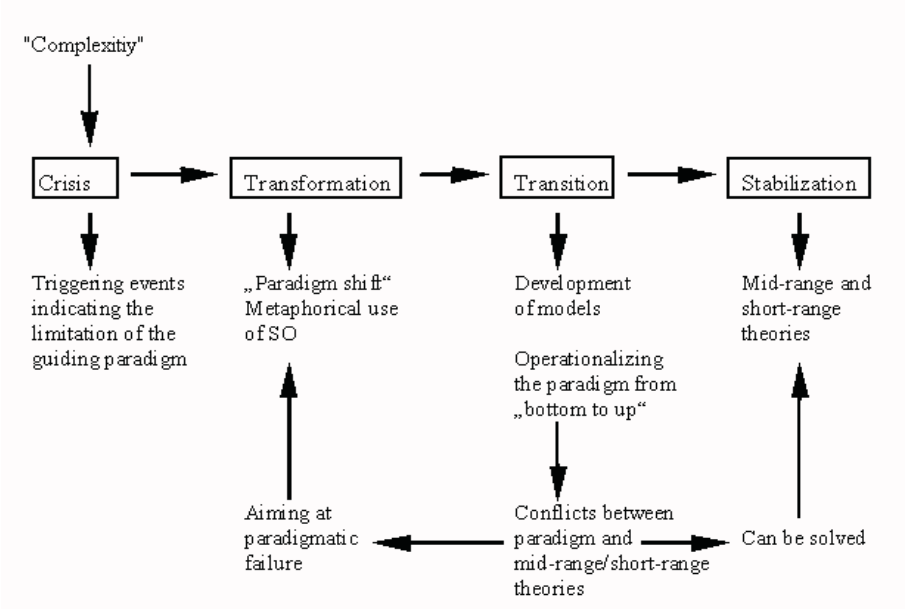
That is quite different to the menu SO presents. In a noble restaurant, "Kugelfish" is served, prepared by thoroughly selected and educated cooks. The menu contains this one meal only. And, the special "kick" is... the "connoisseur" will enjoy it probably only once...

It is a long way from McDonalds' stop-by "haute cuisine" to Aristotle. We can but ask you to accompany us.
In Aristotle's terms the SO paradigm is pure "episteme". Management science in contrast is "applied episteme" and has to be proved in "techne" as well, even before a poor epistemological background.

So, the road-map seems to lie at hands: making interpretative and heuristic use of a paradigm by means of empirically enacting it (inductively relating empirical phenomena and problems to paradigmatic categories and concepts).

Outline of a Partial-Inclusion of SO and Management Science

What are our final conclusions regarding a beneficial penetration of the SO paradigm and management science?
We would like to outline our conclusions in four stages of theory development. For didactic purposes, we elaborate the above example in the overall structure of transformation processes, well-known from concepts of "organizational transformation" (e.g. Levy & Merry 1986). So let us try to apply driving forces, triggering events, crisis, transformation, transition and stabilization phases to a scientific "paradigm shift":



Crisis
Unsolved steering problems trigger the search for a new paradigm. The "release mechanism" for the transformation is constituted by "driving forces" which have to be seen in environmental turbulences and changes, leading to a "new dimension" of complexity. In order to create a new balance between system and environment, the steering-forces of an organization have to become more complex, too (there is no doubt about this, regarding the current management literature on SO).
These driving forces turn into "triggering events" for "traditional management", when the arising management problems can no longer be solved within the frame of the "dominating paradigm" (i.e. the "planning" or

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"formal structuring" paradigm) - in other words, when it is evident that single-loop learning (i.e. improving the "old" paradigm) is no longer possible.

Transformation: metaphorical use of SO
In our case the search for an alternative "guiding principle" ends up with the SO-paradigm grounded in natural and social sciences and (second order) cybernetics. The "new vision" consists in a transfer of the ideas of self-regulation, self-structuring and/or autopoiesis to management approaches. Thus, the second transfer of the SO ideas from physics/biology via sociology/psychology to management science takes place. This function is primarily heuristically-creative. New questions are raised, well-known problems are interpreted in a new way. An new "guiding vision" is formed (in our case: steering by SO), cautious conclusions and interpretations are made; associatively - and not seldom - "quick and dirty". Nevertheless, partial inclusion in this phase means using the paradigm heuristically as a new interpretative base. Theoretical closeness is, at least partially, sacrificed for empirical connectivity.

Transition: - factualizing the metaphor of SO
- development and testing of models and approaches
In this phase, the new paradigm is "bottom-up" filled with concepts and methods in the above described way. In addition to the guiding idea, the "terminological scaffold" is more and more systematically used. As a consequence, contradictions arise - as shown above - because consequent applicative efforts consequently fail. Different interpretative possibilities within the paradigm are tested. Heuristical designs become distinctively shaped. The metaphor of the new paradigm becomes more elaborated. Competitive situations turn up, as mid-range concepts of other paradigms show greater explanatory power with regard to specific questions. The new paradigm can cope with this offensives, if it is able to integrate the competitive approaches, at least in an interpretative way (in our case, this can be seen as the greatest but also most ambivalent strength of the SO-paradigm). This is, however, also a question of the attractiveness of the guiding ideas of the alternative paradigms and of their compatibility with the currently experienced major problems of management. Under certain circumstances a "split-up" of the scientific community may be the result,

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meaning that different "guiding principles" are in parallel and equivalent existence.
One could argue that within management science this is already true. There exist a "technically rational" (engineering approaches) paradigm, as well as a "socially rational (SO) paradigm, an "economically rational" (new micro-economics) paradigm and perhaps even an "ecologically rational" (ecological management) paradigm at the same time, more or less overlapping.

Concluding, partial inclusion in this phase means:

- testing the empirical stability of the paradigm in the derived management approaches
- testing the innovativeness and the "self-transformation" capability of management theory according to the paradigm.

Stabilization
This includes the translation of compatible design suggestions (e.g. contextual steering), the development of criteria for the evaluation of "good" and "bad" design strategies, the definition of relevant design areas, etc. In addition, the exploration (or exploitation) of mid-range and short-range theories has to be pushed forward in order to "bridge" the distance between the paradigm and the heuristic designs (improving the "epistemological" background of the "techne"-dimension of management).
This phase is not very elaborated yet because of two reasons:

- The heuristical use still prevails
- management is conquested by the paradigm, which means that management is in danger to loose its "gestalt" (shape).

Management theory of SO today seems to be located in a "grey zone" somewhere between the transition and the stabilization phase. And, due to its "nature", it is - like always - one step ahead of its own theoretical capabilities: You don't know how far you can go, before you have not gone too far.

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Fußnote

[1] All originally German citations were translated by the author.