Reference: Hülsmann, M.; Grapp, J.: Recursivity and Dilemmas of a Sustainable Strategic Management - New Visions for a Corporate Balancing Efficiency and Sustainability by Autonomous Co-operation in Decision Making Processes. In: Foresight Management in Corporations and Public Organisations - New Visions for Sustainability. Helsinki, Finland, 2005, web-publication, 16 pages

Title:

Recursivity and Dilemmas of a Sustainable Strategic Management

New Visions for a Corporate Balancing Efficiency and Sustainability

through Autonomous Co-operation in Decision Making Processes

Authors:

Prof. Dr.
Michael Hülsmann
Management of Sustainable
System Development
Department of Economics
University of Bremen

Wilhelm-Herbst-Str. 12
D-28359 Bremen
Phone 0421 – 218 – 9773
Fax 0421 – 218 – 7422
E-mail
michael.huelsmann@uni-bremen.de
Homepage
http://www.wiwi.uni-bremen.de/mh

Diplom-Ökonom
Jörn Grapp
Management of Sustainable
System Development
Department of Economics
University of Bremen

Wilhelm-Herbst-Str. 12
D-28359 Bremen
Phone 0421 – 218 – 9774
Fax 0421 – 218 – 7422
E-mail
grapp@uni-bremen.de
Homepage
http://www.wiwi.uni-bremen.de/mh

Acknowledgement:

This research was supported by the German Research Foundation (DFG) as part of the Collaborative Research Centre 637 “Autonomous Cooperating Logistic Processes – A Paradigm Shift and its Limitations”.

Reference: Hülsmann, M.; Grapp, J.: Recursivity and Dilemmas of a Sustainable Strategic Management - New Visions for a Corporate Balancing Efficiency and Sustainability by Autonomous Co-operation in Decision Making Processes. In: Foresight Management in Corporations and Public Organisations - New Visions for Sustainability. Helsinki, Finland, 2005, web-publication, 16 pages

1. Introduction

Sustainability is a largely accepted model of social development, which, however, mainly focuses on the fairly inter- and intragenerative distribution and allocation of property rights in the management of economical, ecological, social and cultural resources. Yet, for a sustainable strategic management the implementation and operationalization of the sustainability calculus in decision making processes is still missing.
In a first step, this paper seeks to show the different interpretation patterns and give prominence to those perspectives, which enable the realization of sustainability on an individual business level. Moreover, it has to be examined whether a sustainable strategic management could be optimized by a recursive approach. For this purpose, the opportunities and limitations of recursivity will be discussed. Secondly, it is presumed that concept-immanent dilemmas connect with sustainability on an individual business level. Therefore, different types of dilemmas and dilemmatic management situations have to be systemized and analyzed. Are there merely inter-conceptual or yet intra-conceptual dilemmas? In a third step, this paper seeks to present options for dealing with the identified management. One of these options will be the concept of autonomous co-operation. As a possible approach to a systematic, competence-based coping with occuring dilemmas, it will be discussed in the context of sustainable strategic management based on a system-theoretic perspective. Finally, the potentials, which could be identified within the concept of autonomous co-operation for corporate decision making processes shall be illustrated. For future perspectives of a sustainable strategic management the visionary aspects within this conceptualization shall be outlined.

2.1. Different Perspectives of Sustainability

The core idea of concept building and the notion of sustainability originated in the English-speaking area. GRAY, for example, characterizes sustainability as the ability to develop, to strengthen and to preserve by one's own opportunities and potentials (Hülsmann, 2004a). Approaching »Sustainable Development« from an etymological perspective, the term »sustainable« derives from the Latin »sustenere«, which in a broad sense describes the support to avoid a fall, and in a narrow sense can be understood as survival assurance. According to MATHIEU, it is referred to developments for ensuring the survival of a company here (Mathieu, 2002).
The origins of the idea of sustainability can be traced back as far as to the 12th century, when it was for the first time set out in writing as economic principle of housekeeping in the monastery of Mauermünster in south-west Germany. In the 16th and eventually in the 18th century, the idea was carried into practice, for example, in the field of forestry under the main principle that wood resources should only be exploited to a degree as it is possible to restore them within the natural regeneration cycle (Vorholz, 2002). The concept of sustainable development, as conceived today, is based on the central idea of the »The Brundtland Report«, published in 1987. Since the beginning of the 90s, this idea has become an integral part of the management discipline.
Sustainability as a leading principle has been reflected in different research disciplines and, therewith, was adopted by a large number of comprehensions. This variety of definitions is presented in the »gallery of definitions« established by PEARCE/MARKANDYA/BARBIER. Although many coexisting understandings of sustainability can be found, the following systematization shows the basic principles of sustainability, which can be identified in the context of management discipline (Hauff, 1987).

2.1.1. Sustainability as a Normative Leading Principle

The normative interpretation is closely related to the comprehension of »The Brundtland Report«, which JÖRRISSEN/KNEER/RINK discuss in terms of an intra- and intergenerative fair economic development (Jörrissen/Kneer/Rink, 2001). Following the core idea of the normative principle, actors on the common and individual level should not consume the substance, but instead live on the output (Schaltegger/Dyllick, 2002). In fact, the industrial nations (25% of the world's population) consume 75% of the global resources (Hülsmann, 2004a). This situation can be considered unfair as at the same time third world nations lose their substance for economizing. Therefore, it is essential to weigh the impact of a decision on others against reactions coming back on oneself and, additionally, to evaluate short-term and long-term results of one's own decisions.
For this reason, the decision making process within the normative principle has to reflect upon an economical, ecological and social dimension; even a cultural or technological dimension could be taken into consideration (Barbier, 1987). The problem within this conception results from the fact that an objective and rational reasoning for a specific and concrete sustainable behavior is not possible, as the question of a satisfying intra- and intergenerative, and particularly individual fairness, can only be answered subjectively and context-related (Hülsmann, 2005).
However, an operationalization or realization of the normative interpretation can be found in two other principles, which give formal instructions for an objective and rational decision making.

2.1.2. Sustainability as an Efficiency-oriented Rationality

The concept of the efficiency-oriented rationality of sustainability aims at an input optimization of resources by means of product- and process-innovations. The first option to realize this principle is to lower the utilization of resources through innovations, for example "by saving costs through minimizing the input of resources and energy" (ECOM AG, 2000).This case, therefore, focuses on the absolute conservation of the substance. The second option is to use resources more efficiently. This alternative, in turn, aims at preserving the substance relatively to the utilization of resources. Overall, this principle of sustainability is based on the efficiency calculus of a rational economizing, comprising an economic as well as a social sustainability (Hülsmann, 2004a). Rationalizing the utilization of resources shall be realized by considering economic growth and resource consumption separately. The separation shall be based on the innovation itself, concerning

- technologies, processes and products,
- intra and inter business coordinational and organizational forms,
- political frame work and conditions of infrastructure.

Thereby, this perspective of sustainability contributes to the realization of the normative perspective (Minsch, 1996).

2.1.3. Sustainability as an Substance-maintaining-oriented Rationality

The substance-maintaining-oriented rationality of sustainability focuses on maintaining the resource basis by taking into account the effects of decision making processes. Therefore, two characteristics have to be considered: first of all, the resource-base has to be preserved by investing in its reproduction; secondly, a balance between the consumption and the supply of resources has to be established (Müller-Christ, 2001). Generally speaking, this principle implies that the utilization of resources will only be approved, if the invested resources can be reproduced or regained (Müller-Christ/ Hülsmann, 2003). For carrying into effect the concept of substance-maintenance the described compensation between resource utilization and resource supply must be provided.

2.2. Recursive Momentum of a Sustainable Strategic Management

In different contexts recursivity means that beginning and end, cause and effect, observer and observed, input and output influence each other and blend into each other. The terms back-coupling or circularity, as well as recursivity or self-reference, are often mentioned in the same context when dealing with a management related issue (von Förster, 1994). To illustrate the meaning of recursivity in a strategic management context, the principle of this term initially has to be examined from its origins.

In the 60s the physician VON FÖRSTER, one of the first interdisciplinary-thinking representatives between natural science and pragmatic solutions, adopted the idea of recursivity and developed the systemtheoretical cybernetic approach. He attempted to prove the existence of a system which organizes itself (von Förster, 1994). In the context of social science as well as in the management discipline, VON FÖRSTER intended to demonstrate how to comprehend recursivity by means of the non-trivial machine. This experiment shows that it is impossible to obtain a certain output from a given input. The reason for this phenomenon is the permanent identity change of the system, based on the previous status of the system. A system as described in the above context must be characterized as self-referenced.

In the 70s the natural scientists MATURANA/VARELA developed their autopoietic theory, which indicates a living system's ability to produce its elements and its structure through autonomous co-operation (Maturana/Varela, 1980). Autopoiesis represents a general organization pattern, which can be transferred into any other kind of living system, irrespective of its structure. One of the main characteristics of autopoiesis is, as well, self-reference. Here, however, it has to be understood as an operational closed system. This means, the system will only open when specific resources are needed for its continuity (Maturana, 1982).

In opposition to this, LUHMANN – against the opinion of MATURANA/VARELA – presents a construct of ideas, in which a system is open towards its environment. He describes his understanding of self-reference as the opportunity for a potentially extended contact with the environment of a system (Luhmann, 1994). A system aims at securing its survival and therefore »it has to control the effects on its environment by the effects coming back on it if it wants to behave rational« (Luhmann, 1994).

Recursivity can be considered as a feature of sustainability based on the fact that every decision has an impact on other economic units (for example on social groups). Consequently, it must be taken into account and needs a back-coupling or feedback. Not only the realization of one's own goals is in the centre of interest, but also the effects on others that result from the decisions involved need to be balanced (Hülsmann, 2005). The following classification shows the various ways recursivity can be interpreted within the different comprehensions of sustainability.

2.2.1. Normative Recursivity

This principle describes the idea of basic recursivity in relation to sustainability. According to the postulate of economic fairness concerning all social groups and generations, established by BALZER/WÄCHTER, the satisfaction of all actors' needs is supported. It is considered to be a major value for a reasonable and responsible economizing in society (Balzer/Waechter, 2002). The principle of a normative recursivity reflects not only upon itself, but also on the effects that decisions may have on other economic units, whose opportunities have to be part of the decision making process as well. From a normative perspective of recursivity, the system becomes more sensitive in such a way as to be able to identify the requirements of the environment, to value their importance, to adapt to its environment and to assure the supply of resources.

In a system-theoretic interpretation this means that a system has to be in permanent

reflection regarding the fairness of its decisions towards others as well as the supply with resources for environmental systems and interaction partners (Hülsmann, 2005).

2.2.2. Efficiency-oriented Recursivity

In particular the system robustness could even be increased by applying this rationality in managerial decision making. Two aspects have a crucial influence on the environmental sensitivity of a system. First, the different efficiency concepts of the environmental systems have to be accounted for. Secondly, the environmental impact of the system can be reduced. The solution to the first aspect is found by LUHMANN, who proposes that the different efficiency concepts of diverse systems undergo a levelling process. During this process the system integrates the efficiency expectations of the environmental systems (Luhmann, 1964). The levelling can either focus on the output by encouraging the system to produce more resources for its environmental systems, which in turn will make participation for environmental systems more attractive, and therefore increase their willingness for co-operation. Or, the levelling can target at the input side, so that the system needs less resources for its production. Both cases raise the system's attractiveness towards its environmental systems (Hülsmann, 2005).
As to the second aspect of reducing a system's environmental impact, a system-theoretic perspective explains the willingness of the environmental systems to provide resources to the system from a different point of view. This willingness results from the fact that they have to compensate lower external costs for their production, which raises the attractiveness of the system even more (Hülsmann, 2005).

2.2.3. Substance-maintaining-oriented Recursivity

According to the interpretation of HICKS/GULLETT, a system constitutes itself through the interaction of resource exchange processes (Hicks/Gullett, 1975). This interpretation refers to the idea of interdependency between a system and its environmental systems. HÜLSMANN even describes it as symbiotic interaction (Hülsmann, 2003). In terms of the system's relationship with its environment, this construct of ideas could be characterized as a survival partnership, in which both parties have to face the problem of substance-maintenance together (Remer, 1993). This kind of co-evolution can only persist, if the system as well as its subsystems and environmental systems collectively assure the continuity of their substance in a global context (Müller-Christ, 2001). Therefore, an intersystemic self-reflection, which ensures a permanent critical analysis of decisions and their impact on the symbiotic relationship, is essential (Luhmann, 1994). Recursivity as substance-maintaining-oriented rationality is only applicable, if the environmental systems are unaffected by external costs of the system and do not lose their capability to produce resources. Correspondingly, a sustainable balancing of supply and demand can therefore only be realized in the long-run.

3. Sustainable Strategic Management and its Immanent Dilemmas

3.1. Definition of Dilemma

The phenomenon of management dilemma in strategic management, and particularly in the field of sustainable strategic management, has been treated in only few publications so far. NEUBERGER, for example, describes the contradiction between management targets on the one side and employees on the opposite side, which may result in a conflict for the company as a social system (Neuberger, 1995). HAMPDEN-TURNER analyzes the dilemma of successful management. He delineates the discrepancy of "inner-directed-motives" and "outer-directed-motives" related to the logic of composing the organizational structures of a specific system (Hampden-Turner, 1990). GEBERT/BOERNER demonstrate the diverging demands of a system's necessity to absorb

complexity through its openness and its ability to handle the absorbed complexity by closure (Gebert/Boerner, 1995). As a core dilemma of management ARAM points out conflicts in the relationship between the individual and its surrounding organization (Aram, 1976). Many authors, such as REMER, FONTIN, GRIMM or HÜLSMANN go as far as to consider dilemmas to be a principle problem of management (Remer, 2003; Remer, 2001; Remer 1997; Fontin, 1997; Grimm, 1999; Hülsmann, 2003; Hülsmann, 2004). Dilemma has been defined as a specific form of a logical conclusion by Fontin. On the one hand, the constructive dilemma is a problem of decision making, in which a goal can be achieved in two different ways, but for neither one there is a specific reason to decide for only this one option. On the other hand, the destructive dilemma suggests the impossibility of choosing between two alternative decisions. The two main characteristics here are that both alternatives present a rational choice, and that their simultaneous realization is impossible (Fontin, 1997).

3.2. Different Types of Management Dilemmas

Corresponding to the comprehensions of dilemma management, different types of dilemmas can be identified. First, the logically conflicting situation for designing a system under complex and dynamic environmental conditions has to be demonstrated.

REMER indicates the dilemma of decision in management. He illustrates the area of conflict as one between two poles, which are referred to as idea and reality in regard to the system. The demands of a system (corresponding to its ideas, for example those of the owner) might differ from the demands of the system's environment (corresponding to reality, for example customers). Both poles can only correspond to each other in the ideal case, but hardly ever in the reality of management (Remer, 2003). Not following the idea entails the system's impossibility to determine and to reach its aims. At the same time, reality and the satisfaction of the demands of the system's environment have to be considered. The difficulty of meeting these opposing demands can endanger the system's existence (Luhmann, 1973; Etzioni, 1960; Etzioni, 1961). This type of management dilemma is a classic one, as it proposes the impossibility of rational decision making. For both poles in the conflict area, good reasons could be found. This means, neither can the poles be realized to maximum extent nor can they be realized simultaneously (Hülsmann, 2003). The dilemma of decision focuses on how to reach the system's aims. It illustrates the fact that decisions, especially in the context of strategic management, are only sustainable as they are balanced between the two poles of idea and reality.

Moreover, the question occurs, of how idea and reality in management dilemmas can be handled successfully. But which is the effort in the context of dilemma management and how is it evaluated? A dilemma of success becomes obvious. Dilemmatic management situations consist of the reintegration of the system and its environment (Remer, 2003). This results from the fact that the borderlines are vanishing. Modern social systems comprise various purposes, for example, as to the relation with their resource holder (Hülsmann/Berry, 2004). Besides the determination of aims in dilemmatic management situations, the system also has to face the question of existence in terms of the continuity of its substance (Remer, 1997). Both goals, considered again as two poles in the context of dilemma management, are the characteristics of a dual term of success, in which idea as well as realistic limitations have to be taken into consideration (Remer, 2003), due to a permanent and increasingly fast changing environment of hyper-linking, hyper-competition, hyperturbulence etc. (e.g. in Bahrami, 1992; Fontin, 1997; Gebert/Boerner, 1995; Grimm, 1995; Hülsmann 2003, Remer, 2001, Weick, 1995). Exclusively focusing on the ideas of management is not acceptable. The classic domination of the term of success must face the conditions of the environment. Substance maintenance and the reaching of aims have to be considered simultane-

ously. Finally, the dilemma of success is a problem of valuation. On the one hand, there is the dilemma of decision, in which different options have to be chosen and weighed. On the other hand, there is the measurement of success of the chosen and weighed options (Hülsmann, 2004b).

3.3. Evidence of Dilemmas

Regarding the identified types of management dilemmas, the question arises in how far the co-existing perspectives of sustainability are context-related to dilemmatic management situations. Consequently, systematization shall be established to cope with the different understandings and meanings of sustainability in respect to dilemmatic management situations.
On the basis of the different perspectives and concepts of sustainability and their specific understandings of the idea of sustainability, **inter-conceptual and intra-conceptual dilemmas** can be differentiated in a first step of systematization. The modern sustainable strategic management is normally confronted with inter-conceptual dilemmas due to the co-existence of three perspectives in the systematization of sustainability, which parallel each other. Intra-conceptual dilemmas already exist either concept-immanent or in respect of the surrounding systems, which may follow the same perspective, but interprete it differently. In a second step, it has to be questioned which **type of dilemma**, whether constructive or destructive dilemma, can be identified when relating different sustainability perspectives to each other. The third step is to distinguish between a **dilemma situation** of decision or success. Here it is questioned whether the system has to decide between two specific comprehensions of sustainability or to take into account the measurement of success.

3.3.1. Inter-Conceptual Dilemmas

Following the first step of systematization, the so called inter-conceptual dilemmas ought to be shown. Two points of view or perspectives must be considered by relating the different perspectives of sustainability to each other. On the one hand the perspective of the own system related to the environment must be considered and on the other hand a system's environmental perspective related to the own system. Relating the efficiency-rational perspective and the normative perspective to each other, from both points of view they are destructive and represent a dilemma of decision. For the own system it might be possible to measure the sucess according to the efficiency-oriented rationality, but it is quite impossible for the other system to operationalize its success through its normative perspective. For a rational decision making from a management point of view the normative perspective has already been identified as an insufficient alternative, given that it only focuses on a subjective, individual and not intersubjective rational construction of a sustainable management. It is not concrete enough, since there is no instrument to operationalize this perspective as outlined above (Hülsmann, 2005). The surrounding system could merely follow abstract rules. Thus, the perspectives exclude each other from the very beginning (Hülsmann, 2003). This interpretation can be adapted in regard to the relation of substance-maintaining as second individual business level perspective and the normative perspective of sustainability.
In the two perspectives of sustainability, which are based on an individual business level, a calculus for rational decision making is given. But which way of measuring the success of sustainable management on the individual business level should be chosen? This is another inter-conceptual dilemma, a dilemma of success (Hülsmann, 2004b). Should the calculus follow an efficiency-rational or substance-maintaining per-

spective? Actually, both perspectives complement each other. Efficiency-rationality proposes the efficient use of relatively limited resources and thereby the willingness of the resource-holders to provide resources to a related system (Hülsmann, 2004). Only by using resources efficiently and avoiding unnecessary waste of resources, the resource-holders will be willing to participate (Staehle, 1991; Hill/Fehlbaum/Ulrich, 1994). However, willingness alone is not enough as the ability to provide resources should not be disregarded and the substance-maintaining perspective is certainly needed, particularly in terms of absolutely limited resources. The substance-maintaining perspective, therefore, supports the maintenance of such resources (Hülsmann, 2004a). Contradictions between the alternative rationalities lay in the different formal instructions for decision making and might – ceteris paribus – be based on their diverging short-term and long-term effects of the calculus of yields and the calculus of the risk of companies. In the efficiency-oriented rationality it is suggested that increasing efficiency leads to short- and long-term yields. Increasing sustainability as to the substance-maintaining rationality through compensation of resource consumption and the supply with resources leads to long-term effects. Concerning the yield in a short-term view, negative effects are to be expected (Hülsmann, 2003).

3.3.2. Intra-Conceptual Dilemmas

Besides the inter-conceptual dilemmas, corresponding to the perspectives of sustainability, three intra-conceptual dilemmas ought to be presented here, all of them resulting from their concept-immanent character of recursivity. In all perspectives of sustainability a constructive as well as a destructive type of dilemma can be found. From the normative point of view there could be good reasons for both perspectives, if they lead to the same result. But as the own system and its surrounding systems may follow their very different abstract forms of ideas, they cannot be combined. Its dilemma of decision lies in the decision between different normative perspectives. The basic question that occurs is whether the own system should behave according to its own comprehension of normative sustainability or whether it should adapt to another company's normative comprehension of sustainability.

The second intra-conceptual dilemma is to be found within the efficiency-oriented rationality principle, which poses concept-immanent problems in a similar way. In respect of the recursive approach it becomes obvious that following only one's own efficiency-oriented rationality may be insufficient. This fact has to be taken into consideration although an efficiency-oriented rationality seeks to realize higher short- and long-term yields, for example, through process innovations to lower the utilization of resources. For a sustainable strategic management the requirement of recursivity implies opportunity and threat at the same time. If the system only takes into account its own efficiency, it risks to negatively influence another resource-holder's ability to provide resources (Hülsmann, 2003). Additionally, the realization of considering one’s own and external ideas of efficiency equally, might pose a problem as understandings of efficiency are individual to the specific company and its context.

The third intra-conceptual dilemma refers to the substance-maintaining perspective of sustainability. Both, the maintenance of the system's resources as well as the effects on other systems through the consumption of resources, are concept-immanent. By focusing on the system’s resources, a substance-maintaining oriented perspective will only be realized by also taking into account the substance or resources of the environmental systems, since both, the system and its surrounding systems, have to live of the same pool of resources. The dilemmatic situation here questions the trade-off between the demands of the own system and the systems of the environment in terms of their supply with resources. In this context of dilemma management the system's suc-

cess must be ensured by determining aims of substance-maintaining on the one hand, and by adhering to the principle of recursivity in order to reach the goal of a long-term sustainable strategic management on the other hand (Hülsmann, 2004b).

4. Management Options for Dealing with Dilemmas

Up to now, systems were merely considered entities, which are able to cope with the demands of their environment. The transmission of idea and reality therefore has been simplified. The four management subsystems (organization, potential, politics and planning) of a system have to achieve a specific purpose (Remer, 2001). This image of consistency, however, has to face its limits. As the system is surrounded by complexity and dynamics, it also has to regard its reality along with its idea. Therefore, management theory has to configurate management systems, which are capable of doing this and to arrange between reality and idea of the system at the same time (Quinn/Cameron, 1988; Luhmann, 1984). Different options attempt to achieve congruency with their limitations as the following examples will illustrate.

4.1. Hybridization of a Management System

This is an option for dealing with management dilemmas in analogy to biology. It implies the crossing of classic and modern elements. The aim is to produce a continuous moderate opening of the system. Each element should be within the average of a scale from completely open (reality orientation) to completely closed (idea orientation) (Remer, 2001). Thereby, this approach is able to cope with any kind of dilemma. As to the so-called situational approach the core-idea is to keep management systems flexible so that they can adapt to varying situations. The contradicting demands of the different comprehensions in the perspectives of sustainability should be dealt with depending on the situational constraints, such as importance, influence etc. (Fiedler, 1967; Lawrence/Lorsch, 1969). For example, a flexible opening and closing of the system is an option to avoid the risk of losing its substance while following an efficiency-rational perspective. The system only provides the surrounding systems with resources as long as its resource basis is not in danger. It closes early enough ahead in time or reopens to absorb the needed quantitiy of resources.

4.2. Conditionalization of a Management System

The conditionalization of a management system contrasts the option described above and refers to management configurations in order to cope with diverging demands towards a system. Both approaches assume a consistent management system with its substance (organizational and potential) and management program (politics and planning). In reality, however, such consistent systems actually cannot be found (Mintzberg, 1979; Miller/Friesen, 1984; Hall/Saias, 1980; Schreyögg, 1987; Staehle, 1999).

In order to deal with problematic management situations, the system's structures themselves have to be problematic and loaded with tensions so that they can absorb the problematic environment (Luhmann, 1973). In modern approaches, for example, Remer focuses rather on the relation between the management subsystems. This seems to be more appropriate than the mentioned image of a consistent system (Remer, 2002). Equalizing the management subsystems (organization, potential, politics and planning) is the central condition to obtain additional capacities, particularly for coping with dilemmatic situations. For example, these subsystems can deal with the inter-conceptual dilemma of different implications coming from the normative perspective of sustainability in relation to the substance-maintaining perspective. The subsys-

tems can ensure the continuity of the system by balancing between the two poles of idea and reality (Hülsmann, 2003).

4.3. Compensation of a Management System

The idea of this option is to allow two existent variables to cope with contradictive demands. One could represent the opening of the system, another one is implemented to avoid the unbalanced orientation of a system. Such variables are adjusted to secure a confinement of the system through, for example, profit orientation or strict controls on employees. The management subsystems themselves can be designed in a great variety for compensational means (Remer, 2002). For example, this could allow to combine different perspectives of sustainability with a specific management system. Another option for compensation could be to balance between the strategy of different companies or intra-conceptual perspectives of sustainability (Hülsmann/Berry, 2004).

4.4. Autonomous Co-operation of a Management System

The options for dealing with management dilemmas presented so far and especially related to the compensational approach illustrate the necessity for balancing a system, although it has been attempted before to implement compensational strategies, for example. Often several diverging demands have to be taken into account and, therefore, it is difficult to find the right balanced point for the system. The system highly depends on the congruence between itself and the environment (Hülsmann/Berry, 2004).

4.4.1. Concept of Autonomous Co-operation

A theory that has gained importance in latest discussions in the management context due to its designability and tractability of complex systems in an unpredictable dynamic environment is the concept of autonomous co-operation. “Autonomous Cooperation" describes processes of decentralized decision making in heterarchical structures. It presumes interacting elements in non-deterministic systems, which possess the capability and possibility to render decisions independently. The objective of Autonomous Cooperation is the achievement of increased robustness and positive emergence of the total system due to a distributed and flexible coping with dynamics and complexity.” (Hülsmann/Windt, 2005).

The core idea is that systems cannot only be regulated by an external force, but also from the inside of the system itself. If a system is allowed to develop on its own behalf it will change over time, which means as well the varying of its balance structure. The approach of autonomous co-operation, therefore, seems to be the ideal concept for the analysis of dilemmatic situations and the implementation of a dilemma management (Hülsmann/Berry, 2004).

In general, for a sustainable strategic management this concept means leaving operative decision making in its sub-systems, -units, and -elements. Consequently, the individual system components are independent from any external instances and are able to design and to follow their individually required and on their situation depending perspective of sustainability. Additionally, the system gains higher flexibility by focusing on smaller organizational units and their relation to other units inside or outside the respective system. It is expected that capacities of planning and especially managing will improve. This results in higher flexibility concerning the adaptation to environmental demands. Regaining and keeping system stability of system elements could eventually lead to more capacities for discovering alternative ways of coping with management dilemmas.

4.4.2. Balancing Efficiency and Sustainability

But how can efficiency and sustainability then be balanced by autonomous co-operation? The system gains the opportunity to react as much flexible as stable to its environmental efforts. Dilemmatic management situations understood as complexity can be absorbed by the system, which is confronted with opposing demands. Even though a sustainable strategic management has to follow the principle of recursivity and, therefore, must in an inter-conceptual view take into account the sustainability perspective of its surrounding systems, it can integrate diverging interpretations of sustainability. This is possible on the basis of the character of a decentralized decision making in heterarchical structures through autonomous co-operation.

For example, on the one hand, the finance department has to achieve its goal according to an efficiency-oriented rationality. But at the same time, the continuity of the system's substance is assumed to be in danger as resource-holders from the environment said they would no longer provide resources to the respective system. In a short-term view they may fear to lose their invested capital. If in a long-term view the external costs are exceptionally burdened upon the resource-holder, problems could also arise with the internal resource availability of the system. Consequently, this implies the recommended recursive perspective in a sustainable strategic management. On the other hand, the situation described above could be a direct problem to the purchasing department, which wants to secure the substance-maintenance of the system by following the substance-maintaining perspective of sustainability. This, in turn, could lead to conflicts for the management.

The situation described above shows a multiple dilemmatic management situation within the system and related to the demands of the surrounding system. These opposing demands are the identified system's goals of sustainability and efficiency. They have to be realized simultaneously. Yet, this will only be possible by balancing between them and not by strictly following only one of them. Autonomous co-operation might be the adequate concept to deal with the necessary trade-off between these poles. According to this approach, the system as a whole as well as its sub-systems, -units, and –elements are confronted with the absorbed complexity of the system, interpreted as dilemmatic management situation. The advantage for a sustainable strategic management could consist in leaving the decision making for designing the efficiency-oriented rationality –in reference to the example- in the finance department. Here, the sub-elements and the respective managers could eventually decide on their relations to internal departments or to elements of the surrounding system and find the individual trade-off to cope with a dilemmatic management situation. Thereby, autonomous co-operation contributes to a reduced complexity for the whole system without neglecting the demands of the surrounding system through decentralized and direct ways of decision making within a recursive management approach.

5. Future Perspectives for a Sustainable Strategic Management

In view of a robust long-term sustainable strategic management the question occurs of how the possible identified abstract contributions of autonomous co-operation can be determined in a concrete way. Corresponding to its characteristics, a tool has to be developed in order to systemize and quantify the optimum degree of autonomous co-operation. Therefore, the measurement of autonomous co-operation becomes the main point of interest. According to the comprehension of the concept, its main character is the decentralized decision making in heterarchical structures as antipole to a centralized perspective.

Now, a sustainable strategic management faces the question of how to define the optimum degree between external control and autonomous co-operation. Such a measurement could be possible in terms of monitoring (the permanent controlling and simul-

taneous measurement of the system's behaviour) and thereby supporting the sustainable strategic management. The future target is to be able to concretely determine, in which departments of a company more autonomous co-operation is needed or will be more effective. This refers to three different levels, the management level (human resources), the information level (data) as well as the technical level (machines).
This leads over to the next future requirement of autonomous co-operation. Along with the implementation of a measuring system to quantify the organizational effect, it has to be questioned, which is the contribution of autonomous co-operation as to its relation between cost and benefit. This dimension will be important to estimate whether the realization of the concept is beneficial regarding its costs (monetary, organizational etc.), meaning that it must not exceed the costs for its implementation. Therefore, future research must focus on the development of a consistent measuring system, which will for once enable companies to decide whether they should introduce this management concept and secondly help them to estimate the contribution to a sustainable strategic management. The long-term vision for every company that focuses on a serious sustainable strategic management should be to approach a corporate balancing efficiency and sustainability through autonomous co-operation in decision making processes (Herzog, 2003).

References

Aram, J. (1976): Dilemmas of Administrative Behaviour, Englewood Cliffs, NJ: Prentice-Hall.

Balzer, I./Wächter, M. (2002): Einleitung, in: Balzer, I./ Wächter, M. (eds.): Sozial-ökologische Forschung. Ergebnisse der Sondierungsprojekte aus dem BMBF-Förderschwerpunkt, München, p. 1-8.

Bahrami, H. (1992): The Emerging Flexible Organization: Perspectives from Silicon Valley, in: California Management Review, 34 (4), p. 33-51.

Barbier, E. (1987): The Concept of Sustainable Economic Development, in: Environmental Conservation, Vol. 14, No. 2 (Summer 1987), p. 101-11.

Ecom AG (2000): Nachhaltiges Wirtschaften.

Etzioni, A. (1960): Two Approaches to Organizational Analysis: A Critic and a Suggestion, in: Administrative Science Quaterly (ASQ), 5th Vol., p. 257-278.

Etzioni, A. (1961): A Comparative Analysis of Complex Organizations, New York, London.

Fontin, M. (1997): Das Management von Dilemmata - Erschliessung neuer strategischer und organisationaler Potenziale, Wiesbaden: Gabler.

Gebert, D./Boerner, S. (1995): Manager im Dilemma - Abschied von der offenen Ge-

sellschaft, Frankfurt am Main, New York: Campus.

Grimm, R. (1999): Die Handhabung von Widersprüchen im Strategischen Management – Eine evolutions- und entwicklungsorientierte Perspektive, Series: Europaeische Hochschulschriften - Series V: Volks- und Betriebswirtschaft, Vol: 2550, Frankfurt et al.: Peter Lang.

Hampden-Turner, C. (1990): Charting the Corporate Mind – From Dilemma to Strategy, Oxford.

Hall, D./Saias, M. (1980): Strategy follows structure, in: Strategic Management Journal, 1, p. 149-163.

Hauff, V. (1987): Unsere gemeinsame Zukunft, in: Weltkommission für Umwelt und Entwicklung (ed): Der Brundtland-Bericht der Weltkommission für Umwelt und Entwicklung, Eggenkamp.

Herzog, O. (2003): Antrag auf Finanzierung des Sonderforschungsbereichs 1980 "Selbststeuerung logistischer Prozesse - ein Paradigmenwechsel und seine Grenzen", Universität Bremen, Bremen.

Hicks H.G./Gullet C. R. (1975): Organizations: Theory and Behaviour, London.

Hill, W./Fehlbaum, R./Ulrich, P. (1994): Organisationslehre 1 – Ziele, Instrumente und Bedingungen der Organisation sozialer Systeme, 5. ed., Bern et al..

Hülsmann, M. (2003): Management im Orientierungsdilemma – Unternehmen zwischen Effizienz und Nachhaltigkeit, Wiesbaden.

Hülsmann, M. (2004a): Bezugspunkte zwischen Strategischem Management und Nachhaltigkeit, in: Hülsmann, M./Müller-Christ, G./Haasis, H.-D. (eds.): Betriebswirtschaftslehre und Nachhaltigkeit – Bestandsaufnahme und Forschungsprogrammatik, Wiesbaden, p. 25 – 72.

Hülsmann, M. (2004b): Das Dilemma mit dem Dilemmamanagement, in: Müller-Christ, G./Hülsmann, M.: Modernisierung des Managements – Festschrift für Andreas Remer zum 60. Geburtstag, Wiesbaden, p. 139-177.

Hülsmann, M. (2005): Nachhaltigkeit – ein Ansatz zur strategischen Prävention von Ad-hoc-Krisen?, in: Burmann, Ch. / Freiling, J. / Hülsmann, M. (eds.): Management von Ad-hoc-Krisen, Wiesbaden. (in print)

Hülsmann, M./Berry, A. (2004): Strategic Management Dilemma – Its Neccessity in a World of Diversity and Change. SAM/IFSAM VII World Congress: Management in a World of Diversity and Change. 5–7 Juli 2004. Göteborg, Schweden, in: Conference

Proceedings ed. by Wolff, R. et al. Göteborg. (published on CD-ROM)

Hülsmann, M./Windt, K. (2005): Selbststeuerung - Entwicklung eines terminologischen Systems, Bremen. (forthcoming)

Jörrissen, J./Kneer, G./Rink, D. (2001): Synopse zur Umsetzung des Leitbildes der Nachhaltigkeit in konzeptionellen Studien und nationalen Plänen, in: UFZ- Diskussionspapiere, Halle.

Kastenholz, H. G./Erdmann, K.-H./Wolff, M. (1996): Von der Theorie zur Praxis: Perspektiven einer nachhaltigen Entwicklung, in: Erdmann, K.-H. v. (ed.): Beiträge zur Ökosystemforschung und Umwelterziehung, Berlin, p. 27-37.

Lawrence, P./Lorsch, J. (1969): Organization and Environment, Illinois: Irwin.

Luhmann, N. (1964): Funktionale Methode und Systemtheorie, Soziale Welt 15, p. 1-25.

Luhmann, N. (1973): Zweckbegriff und Systemrationalität, Series: Suhrkamp-Taschenbuch Wissenschaft, Vol. 12, Frankfurt am Main.

Luhmann, N. (1984): Soziale Systeme - Grundriss einer allgemeinen Theorie, Series: Suhrkamp-Taschenbuch Wissenschaft, Vol. 666, Frankfurt am Main: Suhrkamp.

Luhmann, N. (1994): Soziale Systeme – Grundriss einer allgemeinen Theorie, Series: Suhrkamp Taschenbuch Wissenschaft, Vol. 666, 5. Edition, Frankfurt am Main.

Mathieu, P. (2002): Unternehmen auf dem Weg zu einer nachhaltigen Wirtschaftsweise, Kassel.

Maturana, H. R./Varela, F. J. (1980): Autopoiesis and cognition - The realization of the living, Boston.

Maturana, H. R.: Erkennen - Die Organisation und Verkörperung von Wirklichkeit, ausgew. Arbeiten zur biologischen Epistemologie, translated by Köck, W. K., Wiesbaden.

Minsch et. al. (1996): Mut zum ökologischen Umbau – Innovationsstrategien für Unternehmen, Politik und Akteurnetze, Basel.

Mintzberg, H. (1979): The Structuring of Organizations, New Jersey: Prentice-Hall.

Miller, D./Friesen, P. (1984): Organizations - A Quantum View, New Jersey: Prentice-Hall.

Müller-Christ, G. (2001): Nachhaltiges Ressourcenmanagement – eine wirtschafts-ökologische Fundierung, in: Pfriem, T. (ed.): Theorie der Unternehmung, Vol. 10, Marburg, Bayreuth.

Müller-Christ, G./Hülsmann, M. (2003): Quo vadis Umweltmanagement? Entwicklungsperspektiven einer nachhaltigkeitsorientierten Managementlehre, in: DBW Die Betriebswirtschaft, 63. Vol., no. 3, p. 257-277.

Neuberger, O. (1995): Führungsdilemmata, in: Kieser, A./Reber, G./Wubnderer, R. (eds.): Handwörterbuch der Führung, Enzyklopädie der Betriebswirtschaftslehre, Vol: X. 2nd ed., Stuttgart, p. 533-540.

Pearce, D./Markandya, A./Barbier, E. (1989): Blueprint for a green economy, London.

Quinn, R./Cameron, K. (1988): Organizational Paradox and Transformation, in: Quinn, R./Cameron, K. (eds.): Paradox and Transformation - Towards a Theory of Change in Organization and Management, p. 19-38, series: Tushman, M./Ven, A.v.D. (eds.), Ballinger Series on Innovation and Organizational Change, Cambridge, Mass.: Ballinger.

Remer, A. (1993): Vom Zweckmanagement zum ökologischen Management. Paradigmawandel in der Betriebswirtschaftslehre, in: Universitas, p. 454-464.

Remer, A. (1997): Organisationslehre, in series: Gebert, D. / Remer, A. (eds.): Schriften zu Organisation und Personal, Vol 10, 4th ed. Bayreuth: R.E.A..

Remer, A. (2001): Management im Dilemma – von der konsistenten zur kompensatorischen Managementkonfiguration, in: Die Unternehmung – schweizerische Zeitschrift für betriebliche Forschung und Praxis, ed. by: Schweizerische Gesellschaft für Betriebswirtschaft, no. 6, 55. Vol., p. 353-375.

Remer, A. (2003): Management – Systeme und Konzepte, Bayreuth.

Schaltegger, S./Dyllick, T. (2002): Nachhaltig managen mit der Balanced Scorecard, Wiesbaden.

Schreyögg, G. (1987): Verschlüsselte Botschaften - Neue Perspektiven einer strategischen Personalführung, in: Zeitschrift für Führung und Organisation, 87 (3), p. 151-157.

Staehle, W. H. (1991): Management – Eine verhaltenswissenschaftliche Perspektive, in: Vahlens Handbücher der Wirtschafts- und Sozialwissenschaften, 6. ed., München.

Staehle, W. H. (1999): Management - eine verhaltenswissenschaftliche Perspektive, 8. Auflage, München: Vahlen.

Vorholz, F.: Ökologie: Die Regierung bekennt sich zur Nachhaltigkeit – gezwungenermaßen, in: Die Zeit: Wochenzeitung für Politik, Wirtschaft, Medien und Kultur, Vol. 57.

Weick, K. (1995): Der Prozess des Organisierens, Frankfurt am Main: Suhrkamp.