Sustainable Company Development in a Systemic Perspective

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After a short outline of the systemic approach in management and corporate governance with the most important topic-relevant concepts of this approach, the current and future socio-ecological challenges for companies in this systemic context will be explained. In addition to general examples of these systemic aspects and concrete possibilities for action, the challenges in this context are briefly discussed using the automotive industry as an example.

After some examples of typical systemic aspects in this context, an explanation of the general three strategy options efficiency, consistency and sufficiency follows, including examples, as well as notes on their manifold systemic interdependencies with each other, e.g. systemic rebound effects.

Finally, the approach of biocybernetics is presented in a short overview as a special methodological support for a system-oriented analysis and qualified action orientation in this topic area.

Keywords: systemic approach, interconnected thinking, sustainability strategies, path dependency , systemic rebound effects

INTRODUCTION

Companies have been facing socio-ecological challenges for several decades and will be increasingly affected in the future, especially in the context of sustainability and climate change. In terms of corporate policy, it is a question of dealing appropriately with these challenges; in principle, innovation-oriented strategies based on a proactive corporate policy are to be preferred.

For the justification and concrete derivation of such strategies in companies, the system-oriented management approach can be used. This approach is based on different system concepts and disciplinary approaches. On the one hand, this approach focuses on the interaction between companies and their environment and stakeholders, as well as the resulting responsibilities and strategic challenges. On the other hand, the system-dynamic aspects of this constellation of tasks also play a major role, which includes the derivation of system-appropriate decision routines.

SYSTEM ORIENTATION IN MANAGEMENT AND CORPORATE GOVERNANCE

System-oriented respectively systemic management is a specific conceptual-methodological variant within management and organizational sciences. System-oriented management concepts apply ways of

thinking, methods, and findings of system theories and system sciences to the challenges of designing and managing companies. From this perspective, management in connection with the leadership of companies is to be regarded as the design, steering, and development of purpose-oriented socio-technical systems (see e.g. Ulrich 1984, Malik 1996, Göllinger 2012).

The system-oriented approach understands companies as complex social systems that have grown evolutionarily. Evolved orders require systemic or evolutionary thinking. While technographic thinking assumes that systems can be planned in principle, systemic thinking is far more reserved in this respect; it is aware of the limitations of intervention in complex systems. Systemic thinking recognizes the inherent logic and inherent dynamics of complex systems; it therefore speaks more of cultivation and development.

A characteristic of the system-oriented approach is, among other things, the thematization of the relationship of companies to different environments. As open systems, companies interact with various environments; the economic, social, technological, and ecological environments have emerged as relevant environments. The central question here is which characteristics, conditions, and behaviors enable companies to survive. The criterion for success is therefore the ability of companies to survive.

Modern management theory distinguishes between management in normative, strategic, and operative dimensions. Companies are confronted with value and interest conflicts in a special way. Normative management is concerned with dealing with these conflicts of values and interests in corporate policy.

The basic problem lies in the disagreement between the actors and stakeholders about the normative principles and purposes of the company. Conflicts arise primarily over the appropriate distribution of the benefits and costs of the company's activities among those involved and affected. Normative management strives to reach an argumentative consensus to resolve conflicts. Within the framework of consensus-oriented management, conflicting values and interests of internal and external stakeholders are to be reconciled (Ulrich/Fluri 1995, 21).

Normative management thus serves to support and ensure the social legitimacy of companies. From a systemic perspective, the purpose of a company is to create appropriate benefits for its stakeholders (Göllinger 2012). Only when the relevant stakeholders can expect an appropriate benefit from the company's activities will they sufficiently legitimize the company and thus avoid conflicts.

Strategic management encompasses the core area of corporate management; it is concerned here with the narrower definition of goals and the development of a company's performance potential (Kirsch/Trux 1981, 324). Typical for strategic innovations (e.g. product, process, or organizational innovations) is the complexity of the situation. Uncertainties regarding the relevant environmental conditions in combination with multiple, often uncertain goals and preferences result in a high degree of complexity. In some Publications (e.g. Mack et al. 2016) those attributes are characterised as VUCA (volatility, uncertainty, complexity, and ambiguity).

In such structured problems, linear problem-solving mechanisms fail; the problem solution can only be determined in multiple recursive processes. Feedback structures provide for open learning processes in complex and innovative management decision situations. Such approaches strive for an integrative way of thinking, which also allows for associative, intuitive, creative, and interconnected thinking. The system-oriented approach allows the analysis of the influences of different business environments on companies.

In numerous publications, which claim a system-oriented perspective, this system orientation is exhausted only in the thematization of the interaction relations of enterprises with their various environments. Other fundamental systemic aspects are mostly left out, especially the dynamics of the system. However, complex social systems, such as companies, are characterized by several peculiarities, especially concerning system dynamics and the possibilities of intervention (cf. Forrester 1971, Vester 2012, Dörner 1996, Meadows 2008, Senge 2006, Willke 1993, Dörner/Funcke 2017, Dörner/Meck 2022), which can be condensed to four core features (Göllinger 2012):

- Complex social systems are largely insensitive to many interventions aimed at changing the behavior of the system. They direct actors' attention to system areas where interventions can have little effect. Complex systems have strong internal interconnectedness, so classical cause-and-effect thinking fails here.

- In systems of organized complexity, certain leverage points enable a high degree of system influence. These are the starting points for successful system intervention.
- There is a contradiction between the short- and long-term consequences of political intervention. A political intervention that aims to improve the state of the system in the short term can lead to a considerable deterioration of it in the long term, and vice versa.
- Increasing the autonomy of self-dynamic systems to operational coherence. With increasing self-complexity, systems react more and more to themselves and only selectively to their environment. This process of operative closure ultimately leads to the self-reference of systems.

All these methodological approaches aim at overcoming the widespread linear cause-effect thinking by circular and "interconnected" thinking in feedback structures and use "interconnected" representation formats for this purpose, especially effect networks and feedback loops (Vester 2012, Harrer 2015).

SUSTAINABILITY AS A CHALLENGE FOR COMPANIES

The Normative and Strategic Basic Problem

The task of corporate policy is to point out potential development paths into the future through general goals and the fundamental specification of a basic orientation for preferred behavior in the pursuit of goals. Due to the complexity of the tasks to be handled, a systemic orientation is required at the same time. There are several areas of tension between corporate performance indicators and ethical or sustainability-related requirements. The scope for corporate policy synthesis from both requirement spheres can be expanded through changes in the regulatory framework on the one hand and socio-economic innovations by companies on the other. In the meantime, against the backdrop of the major ecological challenges, especially climate change, and the corresponding social and political requirements, the intersection has expanded in the direction of sustainability. In the future, a sustainability orientation will increasingly become a prerequisite for corporate success.

An expanded understanding of companies and their external relations is based, on the one hand, on the concept of functional orientation (Jantsch 1973; Vester 1976; Göllinger 2001) and, on the other hand, on the concept of stakeholder management (e.g. Reavis/Orr 2021). Furthermore, it is an extension of the traditional perspective according to which companies merely adapt to their environment instead of being able to actively influence and help shape this environment.

As actors, companies are in a systemic dual role: as adaptors to market situations, societal narratives, and regulatory frameworks on the one hand, and as creators of technological, organizational, and institutional innovations that in turn influence these surrounding systems on the other. Ultimately, there is usually a complex web of influencing factors that is difficult to understand and can only be adequately understood using systemic analysis.

The following perspective emerges from these explanations: Companies are open evolutionary systems that interact with different surrounding systems. Relevant environments are in particular the ecological, technological, economic, and social environments.[1] These environmental systems influence a company. As an adaptor, it reacts to requirements from the surrounding systems. At the same time, the company acts as a structural policy actor and influences the surrounding systems. The general function of a company is to create benefits for its relevant stakeholders (functional orientation in the broad sense); a more specific function (functional orientation in the narrow sense) can be seen as the satisfaction of customer needs.

Companies' primary goal is to maintain and promote their ability to live and develop; this requires securing their legitimacy by developing potential benefits for their stakeholders. The regulative idea of sustainability implies an expansion of the stakeholder groups, on the one hand, to include future generations (intergenerative justice) and on the other hand to include today's disadvantaged groups of people (intragenerative justice).

Furthermore, the sustainability goals expand the previous narrow understanding of benefits to include ecological and social aspects to a triad of economic, social, and ecological goals ("Brundtland triad", Seidel 2015). The development of potential benefits requires the development of a meaningful and benefit-creating company. The role of normative management is to ensure the ability to live and develop by designing a

meaningful and function-oriented corporate policy from which an ecologically sustainable corporate policy can be derived in five dimensions.

These five dimensions are substances, processes, products, functions, and sense (Pfriem 1995, Göllinger 2012). Concerning the three dimensions of substances, processes, and products, extensive regulation by state-administrative institutions have developed in recent decades. Companies generally meet these requirements by establishing environmental management as a more or less effective sub-task of corporate management.

In many cases, people associate the goal of "sustainability" with the notion of a one-time transformation that moves a particular system of action (state, region, company, etc.) from a diagnosed non-sustainable state to a sustainable one. Such a conception is, however, severely under-complex, because it overlooks the fact that there are no simple recipes and no universally and timelessly valid solution options, but as a rule only situationally valid and strongly context-dependent solution variants.

The objective of "sustainability" is therefore an ongoing and thus permanent transformation challenge. In this respect, it is more appropriate to speak of "sustainable development", because this articulates the need for a comprehensive embedding of further corporate development in the respective canon of objectives oriented to sustainability criteria. Such transformation processes are characterized by complexity in many respects (Göllinger 2022).

Expanded Target Systems - The Sustainable Development Goals (SDG) of the UN

The above-mentioned three classic spheres of sustainable development ("Brundtland Triad") have now been joined by more comprehensive target systems, which pose further challenges about the formulation of corporate sustainability strategies. For example, with the proclamation of 17 Sustainable Development Goals (SDGs) by the United Nations (UN) in 2015 (UN, 2015), a multi-layered and multi-dimensional SD target system for the respective national level has been available for several years.

Due to the predominantly rather vaguely formulated objectives, there is rather more room for interpretation when it comes to interpreting the goals and deriving corresponding strategies for action; therefore, this tableau of goals should be seen as a more or less broad orientation framework than as a concrete action program for macro-control. In principle, the aggregated 17 goals can, at least for the most part, also be applied well to the microeconomic level. Accordingly, references to this table of objectives can be found more and more frequently in the normative declarations of numerous organizations such as companies, public authorities, administrations, etc.

The 17 goals are described by a total of 169 goal categories (UN, 2019). If they are underpinned by bundles of criteria, they enable a far-reaching operationalization of the goals. However, this also increases the dangers of a narrowed discussion and thus a technocratic illusion of control, because the multilayered mutual interdependencies between the goals cannot be adequately managed by a linear listing and processing of a systematic catalog of indicators. Rather, this requires systemic considerations and analyses, which are available in principle as methods but have so far only been applied to the SDG problem in a few cases. Special reference should be made to the pioneering work of Harrer-Puchner (2021).

Current Socio-Ecological Challenges of Sustainable Development - The Example of the Automotive Industry

For some years now, a variety of developments have been taking place in the automotive industry that have already led to recognizable transformations in the context of a "mobility turnaround". These are not only discussed scientifically, but also, due to their high social importance, in numerous media with a high public profile. Particular attention is being paid here to the challenges posed by product policy. Technological innovations ("product ecology") are to be used to develop, produce and sell more low-emission, low-consumption, and, in particular, climate-neutral vehicles.

The resulting trend toward electromobility represents a major product ecology innovation that is bringing about major structural changes to the value creation networks in the automotive industry and which is particularly affecting the supplier companies, most of which are medium-sized. The other major trend is the increasing digitalization of vehicles (various development stages up to "autonomous driving"), with

similarly major structural changes to the value creation networks. In addition, there are several production policy challenges with a focus on environmental sustainability. These include resource and environmentally friendly production ("production ecology"), the increasing establishment of material and substance cycles in the context of procurement and "disposal" in accordance with the functional principles and rules of a "circular economy" or a "bioeconomy" (cf. Göllinger/Harrer 2022).

These trends lead to a restructuring of value chains or networks with a reorganization of horizontal and vertical interdependencies and thus of the international division of labor (cf. Becker/Mccoy/Watkins, 2019). The organization of value networks to date has been strongly geared to manufacturing costs or procurement prices for components, assemblies, and functional systems. In the future, greater accounts will be taken of the wide range of transaction costs. Up to now, significant shares of the cost advantages of globally distributed production systems have been based on the extensive externalization of social and ecological consequential costs; only a small share is due to natural locational advantages.

However, increasing internalization of external costs (e.g. CO2 pricing) leads to rising production costs and thus to rising goods prices (additional risk of inflation). Furthermore, increasing transaction costs are to be expected due to the need to monitor the various influencing factors as well as the company's effects on the situation. With the implementation of the new "Supply Chain Act" in the EU, the developments outlined here will once again become more pronounced.

Examples of Systemic Aspects in the Subject Area

Linear Recommendations Versus System Dynamic Feedbacks

In the above example, but also numerous other industries and products, there is the problem of supposedly robust recommendations: Both the ecological impact potential and the social conflict potential are subject to permanent change, especially because the various factors influencing these potentials change over time.

This gives rise to the overriding problem of selecting appropriate information because there are usually many different scientific papers, empirical studies, and practical experiences regarding these influencing factors. In addition, it is not only important to gather the supposedly "right" information in the sense of an own situation analysis that is as accurate as possible but also to know the assessment positions, interpretations, and motivations of the relevant stakeholders, since their demands on the company are usually of high relevance for corporate policy decisions.

From a systemic point of view, it is important to emphasize that, for example, a "recommendation" for a particular raw material, product component, or production process ("XYZ instead of ABC") based on a respective current socio-ecological situation analysis often triggers a series of changes in the relevant environmental system if the recommendation receives sufficient attention. Among them usually, also some unintended consequences in the form of undesirable side and subsequent effects of the in each case-met decision. It is often a decisive difference, for example, whether only small quantities of raw material are extracted, or a certain plant is cultivated only in small areas, or whether this is done on a larger scale. The ecological economies of scale of such developments often point in a negative direction.

While in the case of small quantities the most suitable sites can be considered for extraction or production in each case, the higher quantity of material flows and land requirements in large-volume or large-scale production systems increasingly force the less productive or more ecologically problematic deposits and sites to be included in production. This changes the relevant ecological parameters of these production systems and thus the results of the ecological balance for the worse. In extreme cases, this can turn the preconditions for the original recommendation into their opposite.

Fatally, the recommendation of a certain variant ("XYZ") as "ecologically advantageous" or as "sustainable" would then have led to the fact that due to the mass demand for this variant, its ecological advantageousness is less and less given, and can even turn into a disadvantage (Göllinger 2012). One example is biogas: The promotion of large-scale monocultures in corn cultivation led to a perversion of the original idea of biogas plants, which were originally designed for the utilization of biogenic residues and which then largely lost their ecological advantage. The situation is similar for soybean cultivation and palm oil production, both of which were originally recommended as ecologically advantageous alternatives; in

the meantime, serious ecological losses (biodiversity) are taking place here due to the large-scale clearing of the rainforest.

Subcomplex Decision Rules and Path-Dependent Structures

In an evolutionary-systemic context, sub-complex and recipe-like decision and action rules are therefore mostly forbidden. However, due to the complexity of many fields of action and decision-making situations, decision-makers generally rely on proven, traditional, and practiced organizational and decision-making routines and mental models as well as on certain technological paradigms (Nelson/Winter 1982, Göllinger 2012). Both monitoring and variance analysis, e.g., in the context of strategic planning and controlling processes, are often still underdeveloped in organizational practice.

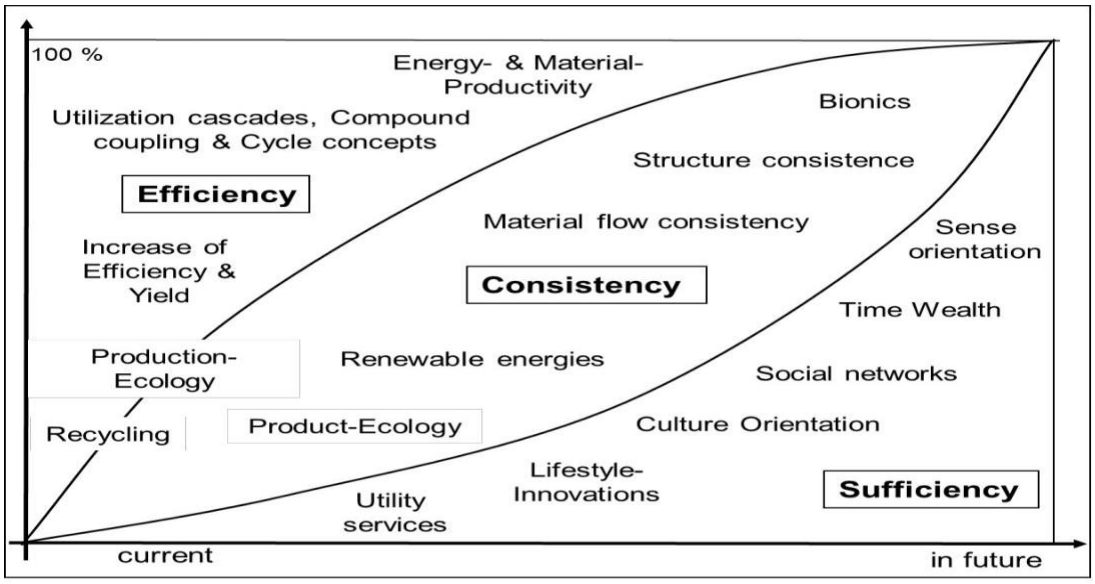
In many cases, the prerequisites for the decision and the relevant characteristics of decision parameters are not sufficiently documented. This makes it difficult to systematically record and discuss changes in the situation and thus apply a qualified variance analysis.

Therefore, in such situations, the continued application of the previously already proven decision routine based on a stable mental model of the decision situation dominates. Thus, no higher-order learning takes place. This is an example of an organizational or institutional path dependency. Path dependencies are based on systemic interactions and generally play a major role in sustainable development, since numerous non-sustainable, and thus suboptimal, structures in products, manufacturing processes, and infrastructures block a change to more sustainable solutions due to lock-in effects, and a reorientation can usually only be achieved by actively breaking the path (Arthur 1994, Göllinger 2012).

General Options for Action and Their Systemic Interdependencies

Companies have a wide range of options for aligning their value-creation activities with sustainable development. These options can each be classified in terms of their general mechanism of action for reducing ecological burdens (Göllinger 2012) (see Fig. 1):

FIGURE 1
RELATIVE IMPORTANCE OF THE THREE SUSTAINABILITY STRATEGIES

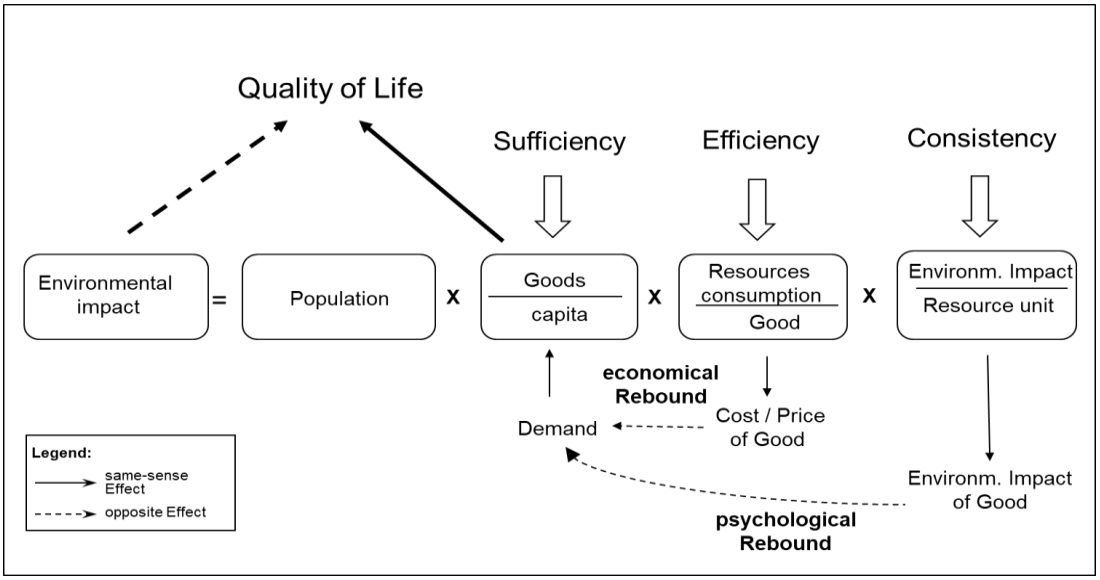


- Efficiency measures aim to reduce resource consumption in the production and/or use of an economic good by increasing efficiency and establishing the use of cascade, composite and closed-loop concepts.

- Consistency measures seek to reduce the ecological burdens associated with the use or consumption of a unit of resources by striving for material or ecological structural compatibility between anthropogenically used resources and nature.
- Sufficiency measures address the issue of the quantitative and qualitative level of well-being of the population.

From a systemic perspective, it should be emphasized that there are no simple linear-causal relationships between these three bundles of measures or strategy approaches. Rather, various economic and psychological interactions lead to rebound effects, which in turn have systemic effects. Fig. 2 shows an example of the systemic impacts of an economic and psychological rebound effect.

FIGURE 2
SYSTEMIC IMPACT OF REBOUND EFFECTS



These explanations show that companies are confronted with several challenges in the field of sustainable development about systemic impact analysis and complexity management. The companies concerned are therefore tasked with building appropriate competencies for dealing with these issues. Systemically oriented methods and software tools, such as those presented below as examples, are helpful in this regard.

Biocybernetics and "Interconnected Thinking"

The Methodology of "Interconnected Thinking", originally conceived by Frederic Vester (e.g. 1988, 2012),[2] applied to a variety of practical problems, as well as the "Eight Basic Rules of Biocybernetics" within the framework of the "Sensitivity Model" have achieved a special popularity. Repeated conceptual modifications and extensions of the methodology in the context of comprehensive system studies and systemically moderated workshops with users from different contexts (companies from various industries, NGOs, municipalities, authorities, universities, etc.) have allowed the methodology to mature into a universal systemic problem-solving methodology, which is particularly suitable for dealing with problems in the context of sustainable development of companies (Harrer 2015).

The System-Logics-Tools, which are based on the sensitivity model of Vester et. al. and have been further developed, together with the moderation and workshop concepts, which have been sharpened and refined in many concrete projects and which are especially topic and user-oriented, for the target group-oriented participation of different actors in a system analysis process, represent the core of the methodology. In particular, due to the long-standing dialog with practitioners as well as the open and software-supported

tool set, this universal methodology enables the processing of any topics from all industries (Harrer-Puchner 2021).

In a moderated and system-oriented process, the participants define the issues, describe the system boundaries, determine the system-relevant influencing variables and query their relationships. From this, the effects of the individual control levers in the overall system are determined and this is interpreted in terms of the system behavior (system cybernetics). With the help of "if-then scenarios", measures are examined about their effects on the overall system and the diverse circles of influence and the dynamics of the system are interpreted concerning their stability and robustness to external and internal changes.

Utilizing this interactive methodology, the decision-makers learn to think generally in interrelationships beyond the current concrete problem perspective and to develop a common understanding of the problem and an awareness of their mental system model.

Especially in organizational change management as well as innovation and transformation processes, the methodology can show its advantages by supporting the actors and facilitators in capturing the diversity of different perspectives and interests, visualizing them trans-parently and ensuring the effective implementation of the elaborated problem solution. Such change processes increasingly determine the current and future challenges for companies. This creates new challenges for companies to identify the systemic risks but also the opportunities and possibilities. This makes it more difficult to apply the conventional analysis tools - e.g. SWOT analysis or BCG matrix, at least in their simple variants - and instead requires a systemic approach, i.e. thinking in systemic contexts, time shapes, and circles of effects.

CONCLUSION AND OUTLOOK

The future conditions for successful corporate development increasingly include the requirements and criteria of sustainability with its ecological and social aspects. In this context, there are manifold interactions and complex interrelationships, the analysis of which requires a systemic arsenal of methods. In this respect, companies face a double challenge: on the one hand, to build up competence potential in the field of sustainable development, and on the other hand, to build up competence potential about system-oriented management methods. In the ideal case, both concerns promote each other synergistically. To support companies in this demanding task, the diverse competencies and knowledge potentials of scientific institutions, associations, and consulting and software companies are available.

ENDNOTES

1. The widely used PESTEL analysis extends the analysis of company-relevant environments to six spheres: Political, Economical, Social, Technological, Ecological and Legal. But from a systemic perspective, this analysis of the environment is often only rudimentary, since usually only a linear, non-networked and one-dimensional analysis of the influence of the individual spheres is carried out, and therefore there is usually no systemic analysis of the interdependencies between the spheres.
2. Frederic Vester (1925-2003) was a German systems scientist who, in addition to the basic rules of Biocybernetics, developed other interdisciplinary concepts and in particular propagated "Interconnected Thinking".

REFERENCES

Arthur, B.W. (Ed.). (1994). *Increasing returns and path dependency in the economy*. Ann Arbor.

Becker, H., Mccoy, J., & Watkins, G. (2019). Influential Article Review - Sustainable Supply Chain Management. *American Journal of Management*, *19*(6).

Dörner, D. (1996). *The Logic of Failure*. New York, Metropolitan Books.

Dörner, D., & Funke, J. (2017). Complex Problem Solving. What it is and What it is Not. *Frontiers in Psychology*, *8*, 1–11.

Dörner, D., & Meck, U. (2022). The Red Trousers. About Confirmative Thinking and Perceptual Defense in Complex and Uncertain Domains of Reality. *Journal of Dynamic Decision Making*, *8*, 1–XYZ.

Forrester, J.W. (1971). Counterintuitive Behavior of Social Systems. *Technology Review*, *73*(3), 52–68.

Gatzweiler, F., Camprubi, A., Liu, J., Harrer-Puchner, G., Hodson, S., Purian Lukatch, R., & Thinyane, M. (2022). Co-creating solutions to complex urban problems with collab-orative systems modelling. *Cities & Health*. Taylor & Francis, London (in print).

Göllinger, T. (2012). *Systemisches Innovations- und Nachhaltigkeitsmanagement*. Marburg.

Göllinger, T. (2022). Nachhaltigkeit in evolutorischer Perspektive. In Lehmann-Waffenschmidt/Peneder (Hrsg.), *Evolutorische Ökonomik. Konzepte, Wegbereiter und Anwendungsfelder* (pp. 313–332). Wiesbaden.

Göllinger, T., & Harrer, G. (2022). *Bioökonomie aus Perspektive der Biokybernetik.* In Jeschke/Heupel (Hrsg.), (pp. 57–89).

Harrer, G. (2015). Cybersystemic tools for politics and business. In R. Ison (Ed.), *Governing the Anthropocene: The greatest challenge for systems thinking in practice*. Proceedings of the 56th International Society of Systems Sciences Conference, Berlin.

Harrer-Puchner, G. (2021). *Collaborative Systems Modelling online Workshop «Health Co-Benefits of Urban Green Spaces in the City of Guangzhou, China» Urban Health and Wellbeing*. IUH Institute, Xieman, China (Online Workshop 21.-25.06.2021).

Harrer-Puchner, G., & Wagener-Lohse, G. (2016). A biocybernetic approach for urban systems in crisis: Systems thinking and the co-operative development of easy accessible sensiti-vity models as a new basis for good governance for sustainable megacities. *XIV International Triple Helix Conference, Heidelberg*, pp. 2 –27.

Harrer-Puchner, G., Rüttinger, M., & Gatzweiler, F. (2018). Co-learning for climate protection through systems thinking: Use of an interactive computer-based simulation game and systems analysis. In *Business systems laboratory - 5th International Symposium, Co-creating re-sponsible futures in the digital age*. University of Naples "Federico II", Naples.

Ison, R. (2017). *Systems Practice. How to Act in Situations of Uncertainty and Complexity in a Climate-Change World* (2nd Ed.). Open University.

Jantsch, E. (1973). Unternehmung und Umweltsysteme. In B. Hentsch, & F. Malik (Hg.), *Systemorientiertes Management* (pp. 27–46). Bern, Stuttgart.

Jeschke, B., & Heupel, T. (Hrsg.) (2022). *Bioökonomie – Impulse für ein zirkuläres*. Wirtschaften. Wiesbaden.

Kirsch, W., & Trux, W. (1981). Perspektiven eines Strategischen Managements. In W. Kirsch (Hg.), *Unternehmenspolitik* (pp. 290–396). München.

Mack, O., Khare, A., Krämer, A., & Burgartz, T. (Eds.). (2016). *Managing in a VUCA world*. Heidelberg, Springer.

Malik, F. (1996). *Strategie des Managements komplexer Systeme* (5. Aufl.). Bern, Stuttgart, Wien.

Malik, F. (2011). *Strategie – Navigieren in der Komplexität der neuen Welt*. Frankfurt/New York: 2. Aufl. Campus Verlag.

Meadows, D. (2008). *Thinking in Systems*. Chelsea Green Publishing.

Nelson, R.R., & Winter, S. (1982). An Evolutionary Theory of Economic Change. Boston (Mass.).

Pfister, M. (2020). Corporate Social Responsibility and Organizational Attraction. A Systematic Literature Review. *American Journal of Management*, *20*(2).

Pfriem, R. (1995). *Unternehmenspolitik in sozialökologischen Perspektiven*. Marburg.
Reavis, M.R., & Orr, D.W. (2021). The Journey of American Capitalism. From Stockholders to Stakeholders. *American Journal of Management*, *21*(4).
Seidel, E. (2015). Biokratie und Brundtland-Triade. Die Rechte der Natur in Ökonomie und Organisation. In Haus der Zukunft Hamburg (Hrsg.), *Rechte der Natur/Biokratie* (Bd. 1). Marburg.
Senge, P. (2006). *The Fifth Discipline: The Art and Practice of the Learning Organization* (2nd Ed.). Currency.
Sterman, J.D. (2000). *Business Dynamics*. Boston u.a.
Ulrich, H. (1984). *Management*. Bern, Stuttgart.
Ulrich, P., & Fluri, E. (1995). *Management: Eine konzentrierte Einführung* (7. Aufl.). Bern, u.a.
UN (United Nations). (2015). *Resolution adopted by the General Assembly on 25 September 2015. Transforming our world: The 2030 Agenda for Sustainable Development*. A/RES/70/1. New York.
UN (United Nations). (2019). *Global indicator framework for the sustainable development goals and targets of the 2030 Agenda for Sustainable Development; adopted by the General Assembly (A/RES/71/313) including annual refinements contained in E/CN.3/2018/2 (Annex II) and E/CN.3/2019/2 (Annex II)*. New York.
Vester, F. (1976). *Ballungsgebiete in der Krise. Eine Anleitung zum Verstehen und Planen menschlicher Lebensräume mit Hilfe der Biokybernetik*. DVA, Stuttgart.
Vester, F. (1980). *Neuland des Denkens. Vom technokratischen zum kybernetischen Zeitalter*. DVA, Stuttgart.
Vester, F. (1988). The biocybernetic approach as a basis for planning our environment. *Systems Practice*, *1*(4), 399–413.
Vester, F. (2012). *The art of interconnected thinking. Ideas and tools for a new approach to tackling complexity* (2nd Ed.). Munich.
Willke, H. (1993). *Systemtheorie I* (4. Aufl.). Stuttgart, Jena.