

Wolfgang Lassl

The Viability of Organizations Vol. 1

Decoding the “DNA” of Organizations

 Springer

The Viability of Organizations Vol. 1

Wolfgang Lassi

The Viability of Organizations Vol. 1

Decoding the “DNA” of Organizations

Wolfgang Lassl
Pure Management Group
Vienna, Austria

ISBN 978-3-030-12013-9 ISBN 978-3-030-12014-6 (eBook)
<https://doi.org/10.1007/978-3-030-12014-6>

Library of Congress Control Number: 2018968374

© Springer Nature Switzerland AG 2019

This work is subject to copyright. All rights are reserved by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

The publisher, the authors and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, express or implied, with respect to the material contained herein or for any errors or omissions that may have been made. The publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

This Springer imprint is published by the registered company Springer Nature Switzerland AG
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

*To Ulli, Veronika, and Armin
for their patience and support
and
in tribute to Stafford Beer († 2002)
a brilliant, versatile, experienced
management thinker
who was courageous to explore new ways*

Preface—Why This Book?

Organizations and their functioning are not a side topic: in the public, private or nonprofit sector, organizations have become one of the most influential social forces in our world that shape our lifeworlds profoundly, as the famous German sociologist Habermas (1995) already pointed out. The state, the community, and the family as dominant social institutions and structures are giving way to organizations, their specific demands, and rationality. Even if freelancing and contract work are growing, organizations will continue to shape our social and economic life¹ and they determine to a great extent a society's development and viability, both now and in the future (Drucker 1993: 41). Modern society can indeed be characterized as a "society of organizations" (Drucker 1992).

Also, on a personal level, we feel their influence: not only do we spend a significant amount of our time in organizations but also even after leaving their physical premises, they manage to captivate us in our thoughts. They create meaning, competencies, motivation, and wealth, but they can also destroy them. Organizations organize and render a society's and its people's resources and knowledge fruitful ... or leave them unexploited or even wasted.

To know how organizations function and what makes them viable should thus not be treated as peripheral and left to chance nor be ignored. Organizations are too essential and vital to people and modern human society. This issue becomes even more important if one observes the amount of stress the individual organizations face nowadays. Especially private-sector organizations, which form a significant part of organizations in society, have become more jeopardized in recent years due to the rapid changes and the growing complexity in today's world. The numerous bankruptcies and takeovers and the rapid rise and fall of icons in the corporate world each year give us a rough indication, how difficult it is for organizations to survive in the long term. Making organizations viable so that they can prosper for

¹ According to a study conducted by Edelman Intelligence and Upwork (2018), 35% of the current workforce in the US work as freelancers. However, one should not overlook that at least 57% of these still have a traditional job (category "diversified workers" and "moonlighters") in an organization on the side. And of the remaining percentage, it can be assumed that a significant proportion is executing projects within an organization (e.g., temporary workers or independent contractors) and consequently, are part of this organization's processes and decision-making procedures.

many decades has almost become an art. The most obvious is the most intricate to understand. What keeps organizations alive and viable remains a mystery. **How do organizations function and what makes them viable?** This is the key question on which this book attempts to shed some light.

Whether an organization survives and becomes viable or not depends on many aspects, such as its products, strategy, people, or disruptive changes in its environment. However, today we become aware that especially an organization's **structure also decides** about its ability to survive and adapt. Structures and their processes determine whether the energy and the capabilities of an organization can be fully released and activated to meet its challenges. Many ideas are born in companies, but organizational structures make a decisive difference regarding which ones become articulated, developed, and implemented. For Drucker (1992), the dynamics of knowledge require that management of change be built into the center of organizational structures.

In a knowledge society and an economic model built on the capacity to innovate, the organizational structure thus becomes an important factor. A structure must not become a break to change and adaptation. In its study on the lifespan of organizations, the management consultancy BCG (Reeves and Pueschel 2015) quite rightly distilled the organization's governance model as the key factor to an organization's long-term endurance and survival. The internal ways and mechanisms as to how an organization decides, acts, adapts, and innovates have a decisive influence on its viability.

Opposed to this structural perspective, the widely-held belief persists that organizations “only” need to assemble sufficiently extraordinary people to accomplish tasks and be successful. The literature on leaders and leadership revolves around this message. While people are important to bring an organization alive, one should not expect too much of what an individual can accomplish. Everyone knows people who are very talented but have failed due to organizational structures. Extraordinary people can only develop their potential in the right setting. Any star depends on his or her team and the surrounding organizational structure.

Furthermore, one also needs to make extraordinary people cooperate and integrate, which is often quite challenging. Success comes from the interplay of many. Finally, the most obvious problem is that extraordinary people are, by definition, an exception, and hence, one cannot fill an entire organization with them.

So, if “employing extraordinary people” is not a strategy, on which an organization can and should rely exclusively, then, for most companies the task is to provide the organizational structures that allow ordinary people to develop extraordinary performance. Here, surprises can be expected. How much potential the so-called “ordinary people” have, we often do not know and cannot even grasp beforehand since current organizational structures and procedures often hinder people from developing their potential. We must then suspect that the organizational architecture has a considerable influence on whether the people in an organization flourish and develop or resign internally and unlearn their competencies.

“When working for my enterprise, my people behave clumsily; but once they leave its gates behind, I am always surprised by how much they can accomplish in their homes, towns, or clubs” a CEO once told me. Organizational structures cannot

cure this discrepancy entirely, but as an executive, it is important to regularly ask, why and by how much the current structures inhibit people to engage fully with their mind and all their talents for their company. In a house or apartment, the arrangement and design of rooms have a considerable influence on whether or not the inhabitants become a viable community. The same is true for organizations: how we arrange units and design the information channels influences how productive we become and how much feel at home, or whether we want to leave the company's premises as fast as possible. This is why we should be concerned with organizational structures ...

Hence, the guiding questions of this compendium are: how must an organization organize and structure itself to become viable? What are the basic building blocks of an organization? What are the basic principles of good organizing?

Especially at the level of macro-level structures, we still seem to be left in the dark. Many of the standard tools, frameworks, and images used for the modeling of organizations such as organizational charts, RACI matrices, and process charts do not depict the life of organizations adequately. Is it not a common experience that "organization" is what mostly happens between "boxes and lines"? A large part of what happens in organizations is not portrayed in official images.

So, where to look for new images? One source could be the vast field of popular management literature, but this type of literature tends more toward reductionism and superficiality. Books of the type "The 5/7/10 ... principles for an effective organization" lure with rapid solutions, but their "solutions" do not meet the complexity and variety of organizations adequately. The systemic character of organizations with their internal feedback effects and interdependencies makes such reductionism merely impossible. Hence, it is clear that the topic of organizational structures needs more serious consideration and reflection.

If we look at academic publications, we face the proverbial trees that no longer let us see the wood—a fact that already Peter Drucker pointed out (2006: ix). Not only do managers lack time to work their way through the abundant academic literature, but so too does the fragmentation and high degree of specialization of scientific papers (Schwaninger 2006: 21) hinder them in gaining the necessary overview to make sound organizational decisions.

This holistic view on organizations is missing today, and organizational design thus often becomes a process of speculation, following fashions, and copying from other organizations instead (often called more technically and respectfully as "benchmarking") than the fruit of one's deliberations. Unfortunately, benchmarking helps very little in that regard: it can supply ideas, but who knows precisely why an organizational structure works better with another company? Often, the model company itself does not know exactly, why a specific structure works. Ultimately, one must think through one's organization, but with what kind of tools and with which logic? This is the challenge that we are facing.

In the absence of coherent organizational logics, organizational design and reorganization processes quickly take on the character of a blind flight appearing arbitrary and rather driven by the gusts of political power games than by rational considerations. Companies will never be free from politics, but the lack of a guiding

model provides politics with much more room since the losses of politically motivated decisions to organizational viability do not become transparent.

While making sense of this general perplexity, I came across the Viable System Model developed by Stafford Beer, a British management cyberneticist and *inter alia* intensely advocated and applied by Prof. Malik and his institute. In a 30-year development process (Beer 1984), Stafford Beer developed this model based on his experience as a manager (including United Steel), consultant, and scientist (for a short biography, see, for example, Martin and Rosenhead 2002).

Since his military service as a psychologist in the British colonial army in India, Stafford Beer investigated the question of whether invariable laws were governing the behavior of individuals within a group or organization and of what they consist (Beer 1984: 7). An experience that we often share is that however different organizations might be, they are not entirely alien to us. Therefore, there must be organizational mechanisms and laws, which despite different organizational contents and contexts are similar across organizations.

For Stafford Beer, the work of the British psychiatrist Ross William Ashby and, in particular, his Law of Requisite Variety (1976), which belongs to the most fundamental laws of system theory, became the basis of his Viable System Model (VSM). Stafford Beer developed some of the key elements of the VSM first as a formal–mathematical model and but then later expanded it into the today known graphical model known today and found in his two major books on the VSM *Brain of the Firm* (1995a) and *Heart of the Firm* (1995b). Both books form the primary foundation for this book.

The application of the VSM in my consulting projects as well as in the many “A-ha”-effects among the participants in my management seminars showed and reassured me that this model could not only offer new insights into the functioning of organizations but also into the diagnosis and development of organizations. Doctors have a model about how the human body works to derive a proper diagnosis and therapy. For organizations, such a model had been missing to me, and the VSM closed this gap for me. It has offered me an invaluable framework to understand the building plan of organizations and address many questions around organizational design and diagnosis. Put into a more figurative language, the VSM has helped me to decipher the “DNA” of organizations, i.e., the “life functions”, and governance principles that are necessary for them to become viable. To make these insights more known and help companies to attain the right understanding of their own functioning and moreover to design better structures is the motivation driving this compendium consisting of three volumes.

Why is the VSM not better known, if it is so powerful? On the one hand, this is because each invention takes a great deal of time to reach a broader audience. On the other hand, this is probably also due to its degree of abstraction to which it exposes the reader, the occasionally complicated style of Stafford Beer’s books, and the fact that Stafford Beer did not always fully sketch out some of his insights. However, this should not deter us from studying it because the basic ideas of the VSM are very intuitive and so close to reality that one wonders why the VSM has not already been developed earlier.

Whoever has understood the VSM will discover how many phenomena and processes in organizations it can explain, and how quickly and yet profoundly one can analyze the problems of an organization and predict the consequences of reorganizations. The VSM works like an X-ray for organizations. As Jackson (2002: 109), the former Dean of Hull University, UK, wrote about the VSM: “A little knowledge of the VSM can take managers a long way. And, it can save them a lot of time [...]; It is all here.” This might sound perhaps a bit exaggerated, but that the VSM adds greatly to the knowledge with many new insights, and that it saves reading many other management books is guaranteed. It is, in the truest sense, a fundamental work.

This compendium of three volumes pursues three purposes: first, it wants to introduce the reader to the VSM and explore what organizational viability means and entails, and how the performance of an organization can be strengthened through the VSM. Second, this book wants to expand the VSM theory: it attempts to work out the inner logic of the VSM with greater detail and close gaps or areas that have not been sufficiently described by Stafford Beer. Third, this compendium also aims to bring the VSM closer to current organizational theory and practice. It tries to remain connected to the VSM as closely as possible, but I have also allowed myself to enrich the VSM with more recent aspects and theories, especially with elements from Niklas Luhmann’s system theory. This compendium understands itself only as an accompanying and supporting book to Beer’s works on the VSM. His books are so rich in details that it would be a mistake not having read them. Notably, his book *Heart of the Firm* (1995b) is recommended to every reader.

Every model is a choice of a perspective on reality and can only focus on one specific perspective. The VSM is no exception to this: it does not claim to be the only perspective on organizations. No model is the reality described in it at the same time: the viability of organizations is undoubtedly more multi-faceted than the VSM may ever be able to describe. The quality of a model, however, does not depend so much on, whether it can describe everything, but rather how well it can explain phenomena and how universally applicable it is within the chosen perspective. In this respect, the VSM is undoubtedly one of the most robust and all-embracing organizational models we currently have, as this compendium intends to show.

This brings us to the structure of this compendium: **Volume 1** introduces us to the VSM and its components. We immerse ourselves into the world of the VSM whose symbols and logic are very different from our typical organizational models. The VSM presents us a new universe, and its symbolic language alone forces us to adjust our conventional perspective and thinking. This has the disadvantage that many things are incomprehensible at the beginning and that one must invest in developing a new understanding. However, the advantage of this strangeness is that it lets one see one’s familiar organization in a new light. One thing can be promised here: through the VSM, one will understand organizations better and more in-depth and will be able to develop more accurate solutions. Thus, the investment in time and thinking are worth it.

Volume 2 attempts to deepen our understanding of the VSM and what constitutes organizational viability. We will not only view the model in its structure (as

we do mainly in volume 1) but also become acquainted with its dynamic dimension. This will allow us describing a variety of organizational dysfunctionalities, i.e., structural errors, and gaining a deeper understanding of many problems in organizations. With all this, we will obtain a good basis for the diagnosis of organizations, which is a key objective of volume 2.

After having familiarized us with the VSM, **Volume 3** ties the VSM back to our standard and everyday organizational language as, for instance, expressed in the organizational chart. We will try to elucidate the systemic functioning of corporate functions in the light of the VSM and show how the VSM can be used to model more accurately organizational structures. Finally, with the VSM, we will also be able to better understand the hot spots of organizational design, such as matrix structures and the implementation of reorganization processes.

The book is intended for practitioners, such as executives, HR, and organizational development managers, as well as for organizational scientists and VSM experts. As far as possible, I tried to avoid abstract and academic language and make the key ideas as tangible as possible by using real-world examples. I tried to limit academic citation to a minimum, in order not to disturb the flow of the text.

Regarding the **“reading strategy”** for this book: the problem of any “book” is that it prescribes in which sequence and to what extent its content must be read. This risks dissatisfaction since every reader has different priorities, knowledge, interests, and preferences concerning the level of detail and the depth of thoughts. One enjoys reading a book if one can quickly and easily obtain an overview of the subject matter, which will thus allow deciding where to go in greater depth. This is especially relevant to readers who are in a hurry or who are entirely new to the topic.

To address this problem, I defined a **“fast-track” reading plan** that tells you which chapters or sub-chapters you should read to get at least a rough overview of the VSM and this book. So, especially if you are in a hurry or are entirely new to the diagnosis and design of organizations or organizational theory, then please follow first only the fast-track reading plan. Then, you can choose and revisit the chapters you are interested in specifically in the sequence and at a pace that suits you best.

For the VSM experts or the readers who want to understand certain aspects in greater detail, in-depth sections have been added and marked as such:

**Do you want more examples of Ashby’s Law?
Then continue reading here, otherwise go to Section 1.3.3**

We can explain this law also very nicely by using an example from sports: let us take a **soccer match** between two countries A and B (see also Malik 2008: 176f). Let us assume that in the middle of the game, a red card is shown, and a player from team A must leave the soccer field. Ten players

You can read these sections right away or save them for a later date when you have gained an overview.

At the end of each chapter, you will find a summary of the essential points of the chapter and questions for reflection. The questions should help you to apply the essential points of a chapter to your organization and transfer the knowledge into practice.

Consider this book as a **catalyst for your own ideas**. No book can or even should cover all issues, due to the limitations of space and time but also because, as author, one has not yet been through every type of experiences. As a reader, you might, therefore, find that certain aspects have been left out, or you might even disagree with some passages from your experiences or interpretation of the VSM. This compendium attempts to explore new facets of the VSM and view it from new angles; it is one but clearly not its final interpretation. Writing a book also means making choices and coping with one's limited knowledge. From this perspective, the book is certainly not yet finished and will never be. However, this is not critical since it will be you who will continue writing this book with your own thoughts. And this is the primary purpose of this book: offering a platform that inspires new thoughts and thinking. With this intention in mind, I encourage you to make notes in a notebook or annotations to the text and thus to create your own book out of this one.

Of course, such a book does not come by itself but is the result of many heads. In this context, I wish to thank **Prof. Schwaninger, Wolfgang Erharter**, and **Hannes Timischl** for reviewing the book and providing me with many valuable thoughts and suggestions. I also would like to thank **Markus Wild** for his graphical talent and patience with me while developing the design and graphical language of this book and the VSM. Without you, the book would not have become what it is today—thank you all!

The test of a good book is whether it can ultimately answer real-life questions—here is a question: two members of a supervisory board of a company once came to me and asked me whether one of their companies should install a Chief Innovation Officer responsible for all business units and directly reporting to the Supervisory Board. How would you approach this question? I hope that this compendium will ultimately enable you to ask the right questions and to develop a solution. How I addressed this question I will elaborate at the end of volume 3, when we have pieced together all the elements of organizational viability.

The volume of a book is often expressed in the number of pages and words. I choose another measure: writing this book required far more than 1,000 espressos. I hope it has paid off for all of you who have decided to embark on reading this book, -may it stimulate your curiosity for organizations like a freshly brewed espresso ...

References

- Ashby, W. R. (1976). *An introduction to cybernetics*. London, New York: Methuen; Distributed by Harper & Row.
- Beer, S. (1984). The viable system model: Its provenance, development, methodology and pathology. *Journal of the Operational Research Society*, 35(1), 7–25.
- Beer, S. (1995a). *Brain of the firm* (2nd ed.). Chichester, England, New York: Wiley.
- Beer, S. (1995b). *The heart of enterprise*. Chichester [England], New York: Wiley. (Figures 21 and 51 republished with permission of John Wiley and Sons Inc. and the permission conveyed through the Copyright Clearance Center, Inc.).
- Drucker, P. F. (1992). New society of organizations. *Harvard Business Review*.
- Drucker, P. F. (1993). *Management: Tasks, responsibilities, practices* (1st ed.). New York: HarperBusiness.
- Drucker, P. F. (2006). *The practice of management* (1st ed.). New York, NY: Collins.
- Edelman Intelligence, & Upwork. (2018). Freelancing in America 2018; October 22, 2018. <https://www.slideshare.net/upwork/freelancing-in-america-2018-120288770/1>.
- Habermas, J. (1995). *Theorie des kommunikativen Handelns*. Frankfurt a.M: Suhrkamp.
- Jackson, M. C. (2002). *Creative systems thinking: A complete approach for successful management*. Chichester: Wiley.
- Malik, F. (2008). *Strategie des Managements komplexer Systeme: Ein Beitrag zur Management-Kybernetik evolutionärer Systeme* (10th ed.). Bern, Stuttgart, Wien: Haupt.
- Martin, D., & Rosenhead, J. (2002). Stafford Beer: World leader in the development of operational research, who combined management systems with cybernetics. *The Guardian*. September 4.
- Reeves, M., & Poeschel, L. (2015). Die another day: What leaders can do about the shrinking life expectancy of corporations. http://img-stg.bcg.com/BCG-Die-Another-Day-Dec-2015_tcm9-76807.pdf.
- Schwabinger, M. (2006). *Intelligent organizations: Powerful models for systemic management; with 6 tables*. Berlin, Heidelberg, New York: Springer.

Contents

1	Life, Viability, and the Art of Keeping One’s Balance	1
1.1	Life and Viability	2
1.1.1	“Life” from a Biological Perspective	2
1.1.2	“Life” and “Viability” for Organizations	3
1.2	Complexity and Organizations	5
1.2.1	The Organizational Chart—An Incomplete Image of the Organization	5
1.2.2	Complexity—Challenge and Livelihood for Organizations	6
1.2.3	How to “Measure” Complexity?	7
1.3	Ashby’s Law of Requisite Variety	8
1.3.1	Ashby’s Law	8
1.3.2	Attenuators and Amplifiers of Variety	12
1.3.3	Ashby’s Law: Newton’s Law for Organizations	15
1.3.4	Organizing as a Continuous Balancing and Learning Process	16
	References	19
2	VSM in Fifteen Minutes—How Does a Soccer Club Function?	21
2.1	A Team of Players—The Core of the Club	21
2.2	Growth and the Need for More Coordination	23
2.3	From Mere Coordination to Control and Optimization	25
2.4	Trust Is Good; Control Is Better	27
2.5	What Will Bring Us the Future?	28
2.6	What Are Our Mission, Values, and Principles?	30
2.7	The Viable System Model	31
2.8	The VSM’s Logical Management Levels	34
	References	37
3	The Product—Core and Foundation of the Organization	39
3.1	The Systems 1—A Programmatic Statement	39
3.2	The Environment of System 1	41
3.3	The Operation—The Place, Where “The Real Work Is Done”	45

3.4	The System 1 Management	46
3.4.1	The Three Systemic Tasks of the System 1 Management	46
3.4.2	Who Is the “Management”?	51
3.4.3	Flexibility Versus Accountability—Why We Need Appointed Managers.	52
3.5	The Regulatory Center	53
3.6	Interconnections to Other Systems 1	54
3.7	System 1 as an Ecosystem.	55
	References	58
4	“Joining and Coordinating Forces”—The Operational Metasystem (Part 1)	59
4.1	What is a “Metasystem” and Why is It Needed?.	60
4.2	Anti-oscillation and Coordination of the Operational Units (System 2).	61
4.2.1	“Keep Cool”—The Function of System 2	61
4.2.2	The Elements of System 2	62
4.2.3	Manifestations of System 2	65
4.2.4	Informal Coordinating Mechanisms: A Blessing or Rather a Curse?	67
4.2.5	“Master and Servant at the Same Time”— The Double Role of System 2	68
4.2.6	“Why Do We Need so Many Rules?”— About the Origins and Size of System 2	70
	References	75
5	“Controlling and Optimizing”—The Operational Metasystem (Part 2)	77
5.1	Controlling the Operational Organization and Generating Synergies (System 3)	78
5.1.1	The Tasks of System 3	78
5.1.2	The Working of the Three Channels in Detail	79
5.1.3	Who Is “System 3”?	81
5.1.4	System 2: Vital Support and Ally of System 3	82
5.2	Auditing and Improving the Operation (System 3*)	83
5.2.1	Why Is a System 3* Needed?	83
5.2.2	System 3*—A Delicate Task	84
5.2.3	The Struggle for Autonomy—The Delicate Relationship Between the Auditors and the Audited	88
	References	90

6	“Looking Outside”—The Strategic Metasystem (Part 1)	91
6.1	System 3’s Double Nature—A Challenge, but also the Source of Its Power	92
6.2	System 4—Why We Need It and What It Does	93
6.3	System 4—Monitoring the Wider Environment and the Almost Known Future	96
6.3.1	“What Is Going on Out There?”—Sensors to the Wider Environment	97
6.3.2	“Which Future Do We Want?”—Modeling and Simulation of Scenarios	98
6.4	System 4—The Organization’s Interface to the Unknown Future	99
6.4.1	“Nobody Knows, What Will Come”—Sensors to the New and Unknown	99
6.4.2	Creativity—The Unknown Future Lies in One’s Hands	104
6.4.3	Prerequisite for Generating Creativity	105
	References	110
7	“Creating Orientation and Direction”—The Strategic Metasystem (Part 2)	113
7.1	What Should We Focus On?—The Need for a Common Picture	114
7.2	“Reality Check”—Confronting the Outside View with the Internal Status of the Organization	115
7.3	“Who Are We?”—System 4 as the Catalyst to the Organization’s Identity	116
7.4	The Organizational Challenges of System 4	117
7.4.1	“If I Cannot See It . . .”—The Future’s Invisibility and Intangibility	118
7.4.2	The Fragmentation of System 4	118
7.4.3	The Superiority of System 3 Over System 4	120
7.5	The Interaction Between System 3 and 4—How Should It Be Designed?	121
	References	124
8	“Decisiveness and Closure”—The Normative Metasystem (Part 1)	127
8.1	Deciding the Undecidable: A Key Challenge for Organizations	128
8.1.1	Why Is a System 5 Needed?	128
8.1.2	“Will This Definitely Be It...?”—The High Bars and Expectations for Every System 5 Decision	132

8.2	“Getting the Full Picture and a Clear Mind”—The Necessary Decision-Making Environment	132
8.2.1	Top Decision-Making as an Open and Heterarchical Process	133
8.2.2	“Make no Mistake Twice!”—The Past as a Risk-Free Laboratory for Today’s Decision	137
8.2.3	Right Decisions Need Many but also Different Perspectives	138
8.3	The Courage to Close the Organization	140
8.4	Who Is “System 5”?	142
8.5	What Are the Manifestations of System 5 Decisions?	143
8.6	Better to Have Examples Than Abstract Principles	144
	References	146
9	“Facing Responsibility”—The Normative Metasystem (Part 2)	149
9.1	Balancing the Strategic and Normative Metasystem	149
9.1.1	“Give Objectivity and Truth a Chance”—The Necessary Balance Between System 3 and 4	149
9.1.2	“I Know It Better”—The Temptation of System 5	151
9.2	The Algedonic Channel—The “Thermometer” for the Organization’s Cohesion	153
9.3	Balancing the Operational and the Metasystemic Organization	157
9.4	System 5—Source for the Organization’s Sense of Responsibility and “Conscience”	158
9.5	“What is Our Value?”—System 5’s Ultimate Responsibility	160
	References	164
10	The Recursivity of Organizations	165
10.1	Vertical Differentiation—An Instrument to Alleviate the Management of Organizations	165
10.2	Recursivity in Organizations	166
10.2.1	The Need for Functional Equivalency	166
10.2.2	“Can’t You Do It Yourself!”—Recursivity and the Need for Self-organization and Autonomy	169
10.3	“There Is no Free Lunch”—Vertical Differentiation as a Challenge	170
10.4	“To Avoid Loose Ends”—Embedding Recursion Levels and Creating Inter-Recursive Channels	172
10.4.1	“Knowing Where Your Home Is”—About the Concept of “Embedding”	173
10.4.2	Between “Laissez-Faire” and “Straitjacket”—How to Design and Use the Inter-Recursive Channels	175

10.4.3	“Can’t We Move Faster?”—Today’s Danger to the Organization’s Temporal Recursivity and Cohesion . . .	177
10.4.4	The Challenge of Delegating or Why the Call “You Only Need to Delegate” Does not Suffice	179
10.5	Hierarchies and Recursion Levels: Are They the Same?	181
	References	183
11	“If We Knew, What We Know ...”—Organizations as Information, Transduction, and Power Systems	185
11.1	Organization as Information System	185
11.2	“People Do Not Seem to Understand Me ...!”—Organizations as Transduction Systems	186
11.3	Information and Power	191
	References	193
12	The VSM—Does it Apply to Real-Life Organizations?	195
12.1	A Meeting	196
12.2	A Project	198
12.3	A Company with Three Business Units	200
12.4	A Family	201
12.5	A School	204
12.6	The Catholic Church	207
	References	209
13	“The Bigger Picture”—Some of the VSM’s Key Messages	211
13.1	Organization as a System of Ecosystems	211
13.2	The Center of an Organization is Its Purpose	213
13.3	Organizational Depth Instead of Hierarchy	214
13.4	Automation, Autonomy, and Viability	216
13.5	Organization—Not an Algorithm	217
13.6	Organizations Have a Structural Logic	218
13.7	“Don’t Take It Personally”	220
13.8	Organizational Images—Comparing the VSM to Other Representations of Organizations	221
13.8.1	The Organizational Chart	221
13.8.2	Process Maps	223
13.8.3	Networks	224
	References	225
14	Not an Epilog, but the Point to Set the Sails	227
	Index	229

Overview of Volume 1

How do organizations function beneath the surface of the organizational chart? What brings organizations to life and what lets them die? What kind of “life functions” does an organization need to become viable and functioning? What does “viability” mean for organizations?

The first volume wants to answer all these questions based on the Viable System Model (VSM) by Stafford Beer:

Chapter 1 introduces us to some of the key concepts relevant to the VSM and without which we would have difficulties in understanding the model, such as “viability”, “variety”, and “Ashby’s Law”.

Chapter 2 quickly and pragmatically familiarizes us with the VSM. For this, a soccer club will serve us as an illustrative example.

Chapters 3–9 are devoted to a more detailed description of the VSM: Chapter 3 describes the operational core of an organization, the systems 1, on which the entire organization rests.

Chapters 4 and 5 introduce us to the operational metasystem, whose system functions are responsible for managing the organization’s operational core. Chapters 6 and 7 are devoted to the strategic metasystem and deal with the organizational prerequisites for responding to the wider environment and the unknown future.

Chapters 8 and 9 explore the challenges and essential processes of the normative metasystem and its attempts to make fundamental decisions and close the organization.

In Chapter 9, we will also discover that the normative metasystem as the “top” of the organization is tied back to its operational basis. Chapters 3–9 thus describe a self-correcting feedback loop that closes the organization and ensures its adaptability.

Chapter 10 addresses the question, how the VSM can be applied to multilevel organizations. The key concept here comes from mathematics, namely, recursivity. What recursivity implies for the design and control of organizations will be the focus of this chapter.

Organizations are held together and moved by information, but what are the requirements for information to flow well in organizations? We will address this question in Chapter 11.

With Chapter 12, we will return to real organizations, and we will test, whether the VSM is indeed applicable to all types of organizations, as Stafford Beer and other VSM theorists and practitioners claim.

In Chapter 13, we will take a step back to assume a broader perspective on the VSM to extract some of the VSM's "key messages". We will compare it with other ways to portray organizations such as the organizational chart. This comparison will help us to understand better the specific value and contribution of the VSM.

If you require just a rough overview and only have a short time available, then follow this **fast-track reading plan** first (without the in-depth sections):

- Chapter 1
- Chapter 2
- The introduction of Chapter 3, Sections 3.1, 3.6 and 3.7
- Chapter 4 up to Section 4.2.3
- Sections 5.1.1 (including the chapter introduction) and 5.2
- Chapter 6 up to Section 6.2
- Sections 7.4 and 7.5
- Sections 8.1 (including the chapter introduction), 8.3 and 8.4
- Sections 9.2 and 9.4
- Chapter 10 to Section 10.2
- Sections 11.1 (including the chapter introduction) and 11.2
- Chapters 12 and 13

Life, Viability, and the Art of Keeping One's Balance

1

It is the same with people as it is with riding a bike. Only when moving can one comfortably maintain one's balance.

(Albert Einstein—Letter to his son Eduard (5 February 1930)
quoted in: Walter Isaacson, *Einstein: His Life and Universe*
(2007: 565))

“To be honest, it has also been our fault!”—Most of us might have already heard or thought this sentence during their professional life. Many organizations would have had enormous potential, but failed to materialize it or, even worse, destroyed it. In many instances, this can undoubtedly be attributed to external factors beyond control or pure bad luck; in other cases, this failure might also be due to internal reasons that could have been avoided and for which the organization can only blame itself.

However, how can we reduce the failure rate, and further how can we bring organizations back to life or create at least the necessary conditions for their viability? How should organizations function and what kind of processes need to be in place in organizations, so that they become viable?

Stafford Beer devoted his whole life to these questions because he realized that the standard organizational images, especially the organizational chart, do not provide sufficient clues to these questions. According to Beer, the life of organizations must take place somewhere else beyond what the organizational chart portrays. Out of these considerations and based on many firsthand experiences in companies, he developed the Viable System Model (VSM).

Like any other model, the VSM is based on a specific perspective and underlying key concepts that one needs to understand before turning to the model itself. We will, therefore, first discuss some of the central concepts of the VSM in this chapter, namely, viability, complexity, variety, and Ashby's Law. In the subsequent Chapter 2, we will then quickly walk through the VSM, thereby using the concrete example of a soccer club.

1.1 Life and Viability

For Stafford Beer, “viability” is the focal point of his model and organizations, but why was viability so important to him and what did it mean for him? Answering this question is not so easy because the term “viability” immediately leads us to a much more complex concept: life. What is “life” and how does the biological term apply to the “life” of organizations? Is this not comparing apples to oranges?

1.1.1 “Life” from a Biological Perspective

What determines biological life precisely is still much debated and will most likely remain so for a long time. Given this, we perhaps limit ourselves to some of the characteristics of life and living beings. We can ask ourselves very pragmatically what constitutes, for example, the difference between a stone and an amoeba (Fig. 1.1)?

Apart from the different substances, one of the most apparent and key differences is that **an amoeba has and perceives an “environment”**, whereas it is hard to imagine that a stone “has” an environment. The stone is just placed in an environment, but the environment does not exist for the stone. The stone is not aware of it. For an amoeba, however, the environment and the boundary between itself and the environment exist: it recognizes a difference between the processes inside and outside of itself (whatever “recognizing” in the case of an amoeba may mean concretely). One of the characteristics of life is that it can—however, precisely—distinguish between “itself” and the “other” outside of itself, i.e., the environment. It makes a difference between an inside and an outside contrary to stones and every other inanimate matter.

This **ability to differentiate and to draw boundaries** is crucial and anything but trivial as one can observe again and again in private life: who lives only for others runs the danger of being absorbed by his or her environment (valid for humans and organizations alike). And the opposite case of altruism, namely, egomania or autism is not sustainable either.

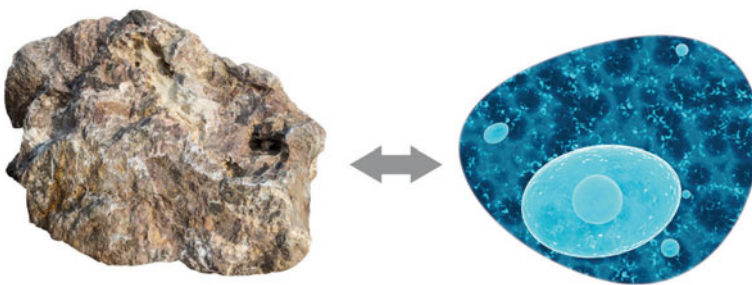


Fig. 1.1 A stone has no life, but what constitutes life in the case of an amoeba? (© Fotolia/stock.adobe.com; artist(s): MrsYa/frenta)

Living beings and their environment do not exist entirely apart from each other. Even if the environment is different from the living being, the environment paradoxically remains an integral part of the living being. Through the living being's relation to the environment, the environment becomes a part of the living being and the way it defines itself. The environment becomes part of its life and identity. Thus, life is characterized by a **constitutive interrelationship between the living being and its environment**: living beings always live together with and in respect to their environment. Life is not autistic, at least not usually.

This relationship with the environment is not only part of their life and "self-understanding" but also an essential foundation for their livelihood: the environment provides energy and raw materials, which living beings absorb and transform through **metabolic processes** into the substances and energy they need. Life also implies having developed a technique to process the various elements in the environment in such a way that the organism can use them.

The environment of creatures is not static but constantly changing and evolving. **Adaptability is, therefore, another essential feature** of living beings. Life, at least in the sense of survival, means continually balancing one's internal state with the changes that take place in the environment. This ability to adapt only becomes possible if a living being differentiates itself into a system of different (cell) functions. So, differentiation into different "**life functions**" and the formation of an **interacting system of these life functions** is another characteristic of life.

Adaption does, however, not only mean that living beings adapt passively to the environment. They can also **adapt the environment actively** to their needs (even if only by building a habitat and protective cave). In contrast to a stone and lifeless matter, creatures are characterized by this capacity to organize not only themselves but also their environment.

1.1.2 "Life" and "Viability" for Organizations

When we observe organizations, we find that many of the characteristics mentioned above regarding biological life also apply to them. An organization is created by its ability to ...

- ... differentiate itself from an environment and live in an interdependent relationship with the environment;
- ... extract and process energy and resources from its environment such as people, raw materials, and money;
- ... organize itself internally and specialize itself in various functions;
- ... and ultimately, adapt either to the environment or adjust the environment to its needs.

Let us just briefly discuss one of the abilities mentioned above, namely, to differentiate oneself from the environment: organizations that are not able to decouple themselves sufficiently from their environment because they want to fulfill every customer's wish and dance according to the "whistle of the customer" will face difficulties, if they need to organize themselves internally.

Fig. 1.2 Do we determine ourselves or are we determined by others?
(© Fotolia/stock.adobe.com;
artist(s): MilousCH)



With this systemic perspective, we get a new and better understanding of many routine aspects of organizational life such as “General terms and conditions” (GTC). They are not just a legal document, but rather function as an important boundary between the organization and its environment. They determine what the rights and obligations of the customers are and more importantly, what they are not. The GTC protect the organization and make the relationship between the organization and its customer more predictable. They help the organization to become more independent from its customers, and shield it from unfounded claims or constantly changing customer wishes.

All the abilities mentioned above are not an end in themselves but lead to the ultimate ability: **to live independently**. Being able to stand and act on one's own feet, to align and organize oneself, and to achieve self-defined goals and not to become a marionette—this is what one wants (Fig. 1.2). This is also what organizations are looking for and what characterizes “viability” in the end: freedom, independence, and self-determination (of course always with respect to others). It is only through self-determination that life gains its full significance.

This is also how we experience it in everyday life: life in the sense of purely biological “vegetation” is not true life. Life only comes in its true form if a living being can determine itself. Fierce battles before or during corporate takeovers show us how important **self-determination** is for organizations. The ability of self-determination is the last thing the targeted organization wants to give up. If nothing else is left, at least, it wants to choose the “white knight”,¹ so by whom it will be acquired.

¹ “White knights” are companies that help a company threatened to be taken over by a hostile company by acquiring it instead.

It is this aspect of self-determination that Stafford Beer had in mind when he was writing about the viability of organizations. From his point of view, the goal of each organization is to achieve viability in the sense of self-determination (Beer 1995: 113f). However, how can an organization achieve viability and self-determination? What “life functions” are necessary and how do an organization’s internal life processes need to work, so that the organization can become and remain viable and self-determined? Stafford Beer tried to find an answer through the development of the VSM. Before we come to it in greater detail, we need to clarify two other important concepts: complexity and Ashby’s Law.

1.2 Complexity and Organizations

1.2.1 The Organizational Chart— An Incomplete Image of the Organization

“If it were only so simple ...!”—one often hears executives exclaiming. Achieving viability and independence is not a simple business, there are always “challenges”, “problems”, and “uncertainties”. The relationship between the environment and an organization is characterized by different and rapidly changing conditions. The central challenge for organizations is to find responses and strategies to these changes and diverse conditions, which we typically describe as being “complex”. If the organization fails to find adequate responses, it will be quickly buried under these challenges, and with it the capacity for self-determination. The primary task of the organization, we can hence say, is to process the complexity of the environment in the best way possible.

We notice from these considerations that organizational structures as shown in the organizational chart unsatisfactorily reflect what is happening in an organization. The word “organization” means much more than boxes and reporting lines. It entails the numerous and diverse activities and efforts that are necessary to bring the environment in its various appearances, structures, and relationships into an order so that it can be processed. **“Organization” as a noun emerges only through the continuous “organizing” and processing of environmental complexity** (and one only needs to think about the diverse types and preferences of one’s customers).

What is complex and how much **complexity an organization wants to process, however, also depends on the organization itself.**² Henry Ford’s famous saying (Ford 2015: 81): “A customer can have a car painted any color he wants as long as

² Cilliers (2002: 78) and Luhmann (1987: 46f) argue even that complexity results, in the end, of the organization itself. Since organizations are limited, they cannot reflect the environment in a one-to-one relationship, but are forced to make a choice. The necessity to reduce the environment and the inability to fully know and comprehend the environment are the factors that constitute complexity for an organization. As Cilliers rightly points out: the world as such is not complex, it simply is.

it is black” illustrates this quite well. Between 1914 and 1926, black was the only color that dried fast enough given the speed at which Ford’s production lines were supposed to run (Kurylko 2003). By limiting the available colors to black, Henry Ford reduced the relevant environmental complexity to which his production system was exposed. Hence, by selecting the scope of the relevant environment (for example, markets and customers), the organization defines the amount and level of complexity that it wants and needs to process. One is, in the end, creating one’s own problems. **Complexity is, thus, also a matter of choice, not just fate.**

1.2.2 Complexity—Challenge and Livelihood for Organizations

The complexity of the environment is, however, not only detrimental to organizations; on the contrary, without complexity, no organization would be needed. Organizations are only useful because the world demands complex combinations of resources to become transformed into products. We, as customers, continuously want more powerful products to fulfill our wishes, objectives, and challenges, and this is why organizations can exist. To this end, **organizations even embrace and search for complexity**, because it gives them the opportunity to prove themselves as useful and valuable.

As individuals, for example, one could try to fabricate shoes from various materials. Fortunately, however, there are shoe manufacturers who can do this better and more efficiently, because they have acquired the knowledge and skills to manufacture, control, and efficiently combine the different resources needed for the fabrication of shoes. Also, they can do this for many different customers and various customer preferences and thereby, they can generate benefits that an individual can hardly achieve such as lower costs through synergies. This constitutes their life basis (Fig. 1.3). Environmental complexity, the ability to bring the environment into a higher order, and to derive from there additional value form the basis of life for organizations.



Fig. 1.3 The complexity of shoemaking provides the livelihood of shoemakers (© Fotolia/stock.adobe.com; artist(s): Elnur)

The size and existence of an organization, however, also depends on the **need for complexity to be processed**. If tasks become easy to accomplish and the complexity diminishes or even disappears, then organizations also become obsolete; one could do it oneself. Complexity thus functions as a guarantee for jobs: with too much simplification organizations and jobs will disappear.

Changes in technology are, in this sense, always changes in the way complexity is processed: technology generates a new form of complexity but makes other things a lot easier. For those, whose complexity has been simplified through these technological advances, this represents unwelcome news, such as for Kodak, the manufacturer of photographic film, with the appearance and mass distribution of digital cameras.

Complexity is, hence, not just something to be avoided, but it is also **the very foundation, in which jobs and organizations rest**. Complexity also needs to be preserved. This is why companies sometimes purposely try to make people's lives not too simple. A product must always also preserve the complexity, in which the organization's livelihood is founded.

1.2.3 How to “Measure” Complexity?

We now come to another key term used in the VSM, the “measure” of complexity, namely, “variety” (Beer 1995: 32ff). “Variety” in the context of the VSM means merely the number of different states that something can assume. A lamp, for instance, has a variety of 2 regarding its operation (Fig. 1.4): it can be switched on or off. Two lamps have already a variety of 4 (i.e., 2×2 lamps), and with three lamps the variety amounts already to 8 (Beer 1995: 33).

Fig. 1.4 Light on or off: the variety of a light bulb is two (regarding its lightening)
(© Fotolia/stock.adobe.com; artist(s): tr3gi)



This is, of course, a very simple example, since we usually cannot calculate the number of states, especially if relationships are nonlinear and multicausal.³ However, this is not so problematic, because we can help us with **relative terms**: one task can be described as being more complex than the other one, and we mean by it that the complexity of the first task is higher than the second. This is a rough comparison without knowing the exact number of different states but this is all we often need to know.

Similarly, we can compare the types of complexity, e.g., by saying that the complexity of one task is different from another one. We then deal with different **types of “varieties”**. Without entirely having understood, or precisely measured and calculated the complexity of a task in detail, we help us and orientate us by these relative comparisons.

1.3 Ashby's Law of Requisite Variety

If the key function of organizations consists of processing environmental complexity and living from it, then the question arises as to what this means for the structure and functioning of organizations. This leads us directly to Ross Ashby's famous “Law of Requisite Variety“ (Ashby 1976: 206f), which is one of the fundamental laws in system theory and the complexity sciences.

1.3.1 Ashby's Law

Ross Ashby, a British psychiatrist, developed and published this law in 1956. The law concerns the control of systems and can be summarized as follows:

Variety can only be controlled by at least requisite (or greater) variety.

What does this law mean concretely? How can we feel it? Ashby's Law formulates elementary wisdom: a car driver, for instance, can and should drive only in environmental conditions that he can master. Anyone who has never learned to drive on ice and in snow will not be able to control a car under such conditions (Fig. 1.5). He does not have the required competency or the so-called **requisite eigen-variety**.⁴ The better the driving ability and driving practice are, the higher the driver's *eigen-variety* is, and consequently, the more and better the driver can

³ In this regard, “variety” as a “measure“ for complexity remains relatively simple compared to other measures (see, for instance, Lloyd (2001). However, for expressing the relationships portrayed in the VSM, the term “variety” suffices, as we will see.

⁴ See Schwaninger's introduction of the term *eigen-variety* as behavioral repertory into the VSM literature and his distinction between *eigen-variety* and structural complexities in organizations (2006: 14). *Eigen-variety* not only encompasses the behavioral dimension but also the availability and quality of resources including time.



Fig. 1.5 An icy and slippery road requires more *eigen*-variety from drivers than a dry road (© Fotolia/stock.adobe.com; artist(s): trendobjects)

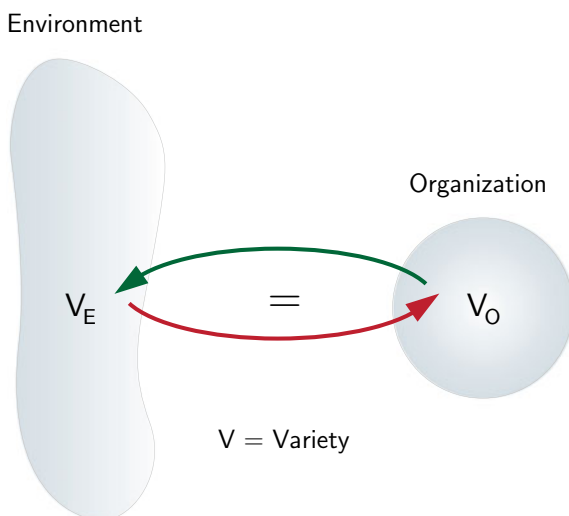
expose him- or herself to greater variety in the environment, such as snow roads. Thus, to be able to control a system and its variety, one needs to have the requisite *eigen*-variety to “absorb” the system’s variety (Beer 1995: 89) or to use Ashby’s famous formulation: “**only variety can destroy variety**” (1976: 207).

Organizations also find themselves sometimes on icy roads or confronted with too much variety: if the product requirements of a customer are too complex, then the organization will have difficulties in delivering the product; and if it does, the chances are high that it will fail. The product cannot be produced and, consequently, the customer needs to adjust his or her requirements. However, the opposite is also true: if a company’s product is too complex for the environment, then it will not find customers. The company will need to modify its products. The organization and its environment need to adapt their varieties to one another. Hence, we find that the relation between the environment’s variety and the organization’s *eigen*-variety can be described as a constant adjustment process (see Fig. 1.6).

What exactly do we mean by the organization’s *eigen*-variety? Expressed more formally, it is the variety that an organization possesses to process (external) variety. This *eigen*-variety consists of many aspects such as, for instance, the organization’s specific competencies, knowledge, skills, resources, systems, processes, and routines.⁵

⁵ The *eigen*-variety of processes and routines often consists in the knowledge developed by the organization on how to accomplish best a certain task.

Fig. 1.6 Graphical representation of Ashby's Law applied to an organization and its environment (adapted from Beer (1995: 96, Fig. 21))



**Do you want more examples of Ashby's Law?
Then continue reading here, otherwise go to Section 1.3.2**

We can also explain this law by using an example from sports (Fig. 1.7) such as **a soccer match** between two countries A and B (see also Malik 2008: 176f). Let us assume that in the middle of the game, a red card is shown, and a player from team A must leave the soccer field. Ten players of team A have now to play against 11 players from team B. Can team A defeat team B? Most probably not, since their *eigen*-variety is much lower than the one of team B. Only if team B also loses one player, will team A again have a realistic chance to win. Following Ashby's Law, variety can only be controlled with at least requisite variety (i.e., the same number of soccer players).

In this example, we have looked at the *eigen*-variety of a team only in a very narrow, namely, quantitative sense. In a soccer game, the *eigen*-variety of a team is, of course, also influenced by other decisive factors (e.g., the players' skills, the team's strategies, and tactics or its level of fitness). By changing the strategy, for example, the smaller team A has the chance to regain the equilibrium. Team A can choose to retreat to the defensive area and concentrate all the players there. This reduces the maneuverability of the bigger team B.

Another possibility is to replace a player with a new and fresh one who has more power and energy. Team A could also try to improve its *eigen*-variety by increasing its energy input (e.g., running more and faster) or by taking higher risks (e.g., more aggressive and daring tactics). In this exchange of the



Fig. 1.7 In soccer, the team with the higher *eigen*-variety typically wins (© Fotolia/stock.adobe.com; artist(s): 103tnn)

teams' varieties, there exist many different possibilities of how to influence the variety equilibrium between both teams, even if not all of them are equally favorable.

To take another example, the **police** could, for instance, try to control criminals in terms of numbers (see Beer 1995: 90). Such a one-to-one relationship between criminals and police officers would have requisite *eigen*-variety, but this is costly. Hence, it is more intelligent to work with other means: the use of a patrol car or surveillance cameras increases the number of observable persons per policeman and thus establishes requisite variety with fewer police officers. The use of statistics ultimately allows the police perhaps to make predictions about when and where crimes might most probably take place. By increasing its *eigen*-variety through software and algorithms, the police can then reduce the staff required and still achieve a balance with the criminals.

We too try to control varieties **in our professional life**, for example, in negotiations, where we try to obtain as much information as possible about the other side beforehand so that we can play out our strengths (surplus of variety) against the weaknesses of our opponents (variety deficits). If we do not know how to proceed during negotiations, then we use time in our favor. Through breaks or adjournments, we can gain time to regroup, change our existing strategy, develop a new one, or get more information and thus increase our *eigen*-variety. Negotiations are an excellent opportunity to see Ashby's Law in operation.

We encounter Ashby's Law also in the field of **personal working methods**: shall I immediately answer an email or shall I rather wait until I have enough information and a clear mind to formulate a good response, so if

I possess requisite *eigen*-variety? Variety can also be controlled by our physical presence: if I want to confront an employee in the event of misconduct and if I do not want him or her to escape from his or her responsibility, then I can seek this person out personally. Through my physical presence, the person's radius of action becomes reduced. Conversely, if we do not want to listen to unpleasant news, we retreat and pretend that we are not available, so as to gain time to develop counter strategies.

1.3.2 Attenuators and Amplifiers of Variety

Unfortunately, environmental variety is not static but dynamic. Consequently, organizations need to react and adjust to the constant changes in environmental variety. For this, they have two basic options available: they can either dampen the incoming variety of the environment or they can increase their *eigen*-variety. In the first case, they use so-called **variety attenuators**; in the second case, they apply **variety amplifiers**. What do these terms mean concretely?

A bit similar to the volume button of a sound system, which increases or reduces the volume, variety amplifiers and attenuators augment or lower the (*eigen*-)variety. Let us take the example of a car (Fig. 1.8): if one wants to get to a destination faster, one needs to press the gas pedal, which increases the actual *eigen*-variety of the car.



Fig. 1.8 Variety attenuators and amplifiers in a car: the gas pedal increases the car's *eigen*-variety, whereas the brake reduces it (© Fotolia/stock.adobe.com; artist(s): sedoyfoto)

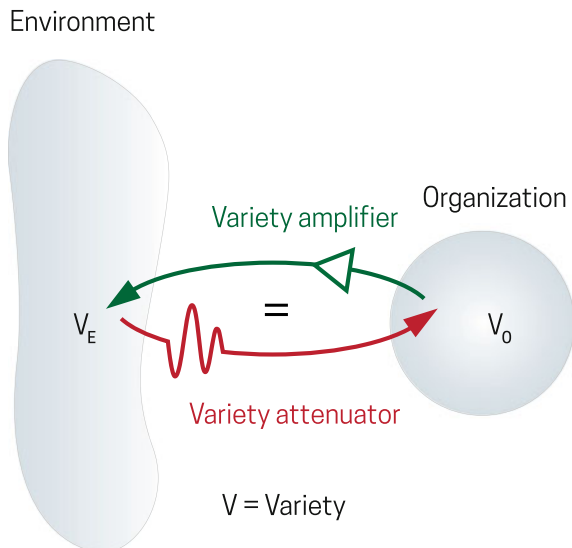
If a car is approaching from the opposite direction on the same lane, one presses the brake to reduce the speed of the car, i.e., its *eigen*-variety, so as to bring the situation under control.

These mechanisms can also be found in companies (see Fig. 1.9). If, for example, a company loses market share (an indication that it no longer has the requisite variety for its environment), then it tries to increase its *eigen*-variety. It does so, for example, by introducing new products, improving its advertising and marketing, training salespeople, upgrading its production processes (e.g., for quality and delivery problems), relaunching existing products, boosting the R&D budget, and acquiring competitors or technology partners.

However, companies also try to dampen the variety of their relevant environment or their *eigen*-variety, if it becomes “too much for them,” for example, if they cannot process customer requests anymore in a meaningful way and thereby lose money. Organizations then withdraw from markets, reduce the variety of their products, try to limit the expectations of their customers concerning their products and service, or slow down their rate of innovation.

Ashby's Law also implies that the higher the *eigen*-variety of an organization, the more environmental variety it can control. Whether a strategy is successful depends not only on the environment (e.g., market or industry structure) but also on the organization's internal capabilities and resources. Management theory expressed this aspect in the theory of the resource-based view (Penrose 1963, ©1959; Wernerfelt 1984) and dynamic capabilities theory (Teece et al. 1997).

Fig. 1.9 Variety attenuators and amplifiers help the organization to find an equilibrium regarding their targeted environment (adapted from Beer (1995: 96, Fig. 21))



**Do you want to learn more about variety attenuators or amplifiers and how we experience them in daily life?
If so, then continue reading here, otherwise go to Section 1.3.3**

Variety amplifier and attenuators operate in many places in organizations: in meetings, an **agenda** reduces the variety to a specific set of topics and only this dampening makes concentrated work and concrete results possible. However, what, if this attenuation is too strong? The agenda item “**Any other business**” or “**other issues**” ensures that important variety that has not yet been addressed in the meeting can be tabled and discussed. “Any other business” functions as variety amplifier for a too restrictive agenda.

However, the item “**Any other business**” is also dangerous, because nobody can predict what the issues of the participants will be. This variety amplifier, hence, needs some additional fine-tuning, for instance, by using the time dimension: if the item “Any other business” is deliberately moved to the very end of a session, the limited amount of time available can then serve as a welcome excuse to postpone unwanted issues to a later point in time and functions as a dampener.

Sometimes, organizations hold workshops, in which people are called to **think “greenfield”**, i.e., free from constraints, or in which people should develop innovative ideas through creativity techniques. The purpose of this variety amplifying workshop method is as well to increase the *eigen*-variety of an organization (because apparently one did not have enough ideas or moved around in circles). A **workshop moderator** is a person who is supposed to know how to control the varieties within a workshop. Consequently, a moderator needs to have a good sense, as to when variety should be increased, i.e., by stimulating the discussion, and when it should be reduced, i.e., by focusing the group and summing up the debate to its main conclusions.

Defining an objective works as a variety attenuator for workshops (see also Barnard 1968: 14): “we focus only on this goal and not on any others!” As Michael Porter (1996: 70) once put it succinctly: “the essence of strategy is choosing what not to do.” Through the attenuator “objectives”, the organization focuses on less, reduces the variety that needs to be processed, and can use its energy more specifically for a limited number of issues.

The function of **secretaries and assistants** (Beer 1995: 179) can now also be better understood: they act more or less continuously as variety amplifier and attenuators for the executives for whom they are working. They perform many functions that their superiors are no longer capable of performing themselves. They are there to increase the variety of their superiors. However, they are also used as attenuators, for instance, to reduce access to their bosses.

Many bosses use their staff as “buffers”—which might sometimes be dangerous if valuable information cannot reach them.

The reference to “**established practice**” or the famous “It-has-always-been-like-this”—principle also functions as variety attenuator—one allows only these practices that have “always been used.” Alternatively, let us take an example from statistics: the “average” of a data set, widely used in corporate reports, also is a considerable variety attenuator and we are often not aware of it. We use it to detect patterns amid a multitude of data. However, the average also dampens the variety of the data set; therefore, to counterbalance and estimate this dampening effect, we use other statistical measures, such as the standard deviation or the median.

As one can see from these examples: everyday life is marked by the constant use and interplay of variety attenuators and amplifiers.

1.3.3 Ashby's Law: Newton's Law for Organizations

Even though Ashby's Law is quite obvious, one wonders why organizations neglect it in everyday life. How often do organizations fail to verify, whether they have for their chosen strategy and plans requisite *eigen*-variety, as, for instance, the high failure rate of mergers shows? It is similar to driving a car on an icy road without sufficient practice or playing soccer against the world champions with a team of just ten players. For Stafford Beer (1984: 11), **Ashby's Law for organizations is comparable to Newton's law of gravity**: anyone who wants to ignore it will be unpleasantly surprised.

This implies that the viability of an organization cannot be determined just by looking at the organizational chart structure. If the task of organizations is to process complexity (see above), then the **organization's viability can only be assessed in view of the balance between the environmental variety** that the organization processes and **the organization's *eigen*-variety**, i.e., its resources, skills, and competencies. The diagnosis and design of organizations must therefore always begin there, i.e., by comparing the environmental variety to be processed with the *eigen*-variety of the organization. How are we set up as a company? Do we embrace too much environmental variety, or have we found the “trick” to cope with the variety that we have selected?

Only if the right balance between the *eigen*-variety of the organization and the environmental variety has been found, can the organization act in a self-determined way, and only then can it become viable.

1.3.4 Organizing as a Continuous Balancing and Learning Process

Finally, we must correct a quite recurrent misunderstanding: **Ashby's equilibrium is not static but if observed across time it becomes highly dynamic.** The environmental variety is constantly changing, and organizations also constantly alter their *eigen*-variety. Whoever has gained the balance might have already lost it at the next moment. As the saying in politics goes, “after the election is before the (next) election.” Organizations must therefore continually try to find a new balance between the targeted environmental variety (black line in Fig. 1.10) and their *eigen*-variety (green line in Fig. 1.10). This meandering around the equilibrium might take the form as shown in Fig. 1.10.

For a long time, an organization might find itself in a relatively stable equilibrium with its environment (up to point 1 in Fig. 1.10). However, at a certain point either the environment changes (e.g., new technologies, competitors, and consumer preferences) or the company expands its targeted environment (e.g., new markets). Consequently, the relevant environmental variety increases steeply (at point 1 in Fig. 1.10). Whether intended or not, this change puts the organization under stress: it must dramatically increase its *eigen*-variety (e.g., additional resources, competencies, and infrastructures) and, perhaps even more fundamentally, its way of operating. The organization then undergoes a veritable metamorphosis: the caterpillar needs to become a butterfly. A continuous adaptation process may then follow

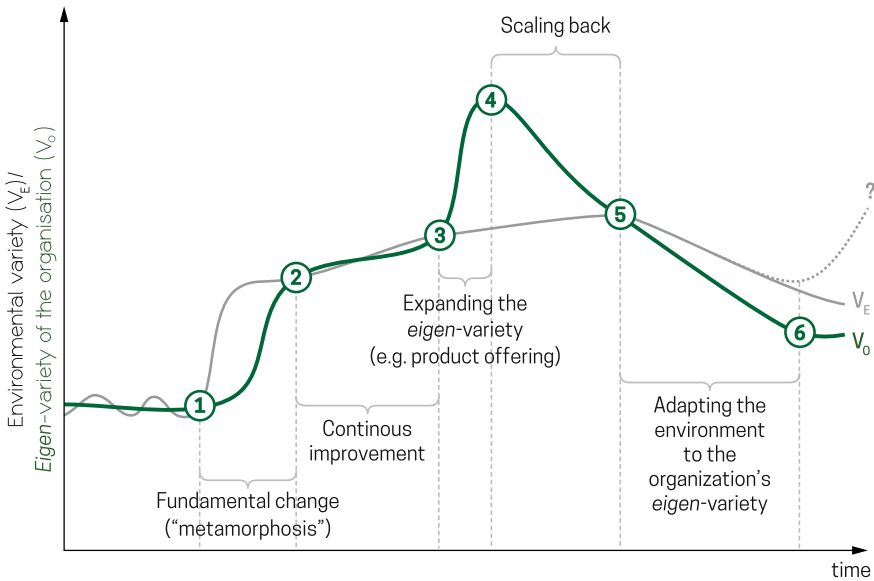


Fig. 1.10 Dynamic evolution of the balance between the environmental variety (V_E) and the organization's *eigen*-variety (V_O)

once the fundamental imbalance to the environmental variety has been overcome (from point 2 onward in Fig. 1.10) and the environment has entered a phase of only gradual changes.

However, an **imbalance can also be triggered by the organization itself** if, for instance, it increases its *eigen*-variety and the environment does not follow (point 3 in Fig. 1.10). This happens, for instance, if the company becomes too innovative and develops products of which the consumers have no use or for which there is no market. This leads to a disequilibrium that the organization needs to correct (at point 4 in Fig. 1.10) such as reducing the product offering, the innovation rate, or the number of markets served.

The **relationship between environment and organization thus always is bidirectional**: not only does the environmental variety determine the organization's necessary *eigen*-variety but the organization also influences the environmental variety. What we can do and achieve in our lives also depends on the products and services offered by organizations. Sometimes, organizations tend to forget this bidirectionality if, for instance, they attempt to achieve power over their environment such as in dominant or even **monopolistic market positions**. In these situations, the environment's variety becomes determined by the organization, which then allows the organization to adjust the environment's variety to its *eigen*-variety (point 5 in Fig. 1.10).

Two negative dynamics can, however, emerge in such a situation, of which organizations are mostly not aware: first, there exists the risk of losing *eigen*-variety due to a lack of stimuli, complacency, and unlearning. Organizations in dominant positions face the temptation to limit and reduce the environmental variety to their needs, capacities, and competencies. However, if the variety of the organization's environment diminishes, its *eigen*-variety also tends to fall, since why should the organization maintain extra *eigen*-variety? In dominant market positions, an organization thus runs the risk of unlearning, petrifying, slowing down, and becoming inward-focused. Competition and demanding customers are sometimes nerve-cracking but in principle, they also stimulate development since they force to maintain or even expand one's *eigen*-variety—and this is what good managers and executives know and welcome.

Second, monopolies or dominant positions never last forever; the environment can never allow it to be entirely controlled and nor can a single organization control its environment entirely. At some point in time, the environment will thus revenge itself for being dominated as anti-trust cases show. It will try to increase its variety (point 6 in Fig. 1.10) and overwhelm the organization. **Achieving and maintaining stability is thus, quite paradoxically, the result of an inherently dynamic, continuous and, above all, mutual learning and adaptation process** for the organization and environment; and both must keep the process fluid. And this is what Ashby's Law stands for.

At this point, one needs to add an important aspect: stability apparently comes through movement, but movement per se is not a guarantee. Like a cyclist, it also needs a **sense of balance** and **direction** as to where one wants to go. The Charybdis and Scylla of organizations are “we must constantly reinvent ourselves” and “we

continue as we have done before.” Both statements, if taken absolutely, lead to a standstill and even chaos. They lack direction and a sense of balance: they fail to distil and weigh the salient points in their changing environment and thus cannot find a viable target. The path of viability in which organizations must walk is narrow: organizations must not petrify and become rocks (Scylla), and thereby become a place where ideas and innovations get smashed nor, should they become a whirlpool (Charybdis) where new and rapidly replacing strategies, innovations or reorganizations do not mean progressing but rather circling a perhaps abysmal (strategic) void.

How organizations need to organize themselves internally to keep moving as well as to develop this sense of balance and direction is what we want to explore through the lenses of the VSM. A journey into the multiple facets of organizational life awaits us and at the end of which we will appreciate the miracle that and how organizations function and become viable.

Summary

- “Viability” in the sense of the VSM means the ability of an organization to organize itself, to meet the challenges of the environment, to act autonomously, and to choose its future itself.
- To this end, organizations must draw boundaries between themselves and the environment. They need to develop different systemic functions as well as the ability to adapt themselves to the environment or the environment to their needs.
- The key task of organizations and one of the foundations of their livelihood is the ability to process environmental complexity. “Organization” is the continuous process of adapting and organizing the processing of environmental complexity.
- In the VSM, complexity is conceptualized as “variety”, i.e., the number of possible different states.
- Complexity is not only a burden but also the basis of an organization’s livelihood. Without variety, the organization and its products could not exist and create value.
- To process environmental variety, every organization needs *eigen-variety* which consists of, for instance, its resources, competencies, skills, and technologies (including access to these factors).
- Ashby’s Law applied to organizations stipulates that every organization needs at least requisite *eigen-variety* in order to process and control the targeted variety of the environment.
- To establish equilibrium with the environment, organizations can use either variety attenuators, which reduce the incoming environmental

variety (e.g., customer wishes) to a level that the organization can process or variety amplifiers, which increase the organization's *eigen*-variety to the level of the targeted environmental variety.

- The equilibrium between the organization and environment is not static but instead needs to be continuously found through a mutual adaptation and learning process.

Questions for Reflection:

1. Do you experience your organization and yourself to be self-determined or rather externally driven?
2. Wherein does the variety of the environment of your organization and area of responsibility consist? What are the environmental factors that challenge your organization and your work in particular?
3. How well are your products protected against technologies that could simplify them or process variety better than yours?
4. How do you view the *eigen*-variety of your organization in relation to its target environment? Where is it greater or smaller than the variety of the chosen environment? Where does the organization achieve requisite variety with its environment and where not? Do your colleagues, employees or superiors share your view and if not, why?
5. What kind of variety attenuators or amplifiers do you use in your professional and private life?
6. In which phase of Fig. 1.10 do you currently find your organization?

References

- Ashby, W. R. (1976). *An introduction to cybernetics*. London, New York: Methuen; Distributed by Harper & Row.
- Barnard, C. I. (1968). *The functions of the executive*. Cambridge: Harvard University Press.
- Beer, S. (1984). The viable system model: Its provenance, development, methodology and pathology. *Journal of the Operational Research Society*, 35(1), 7–25.
- Beer, S. (1995). *The heart of enterprise*. Chichester [England], New York: Wiley. (Figures 21 and 51 republished with permission of John Wiley and Sons Inc. and the permission conveyed through the Copyright Clearance Center, Inc.).
- Cilliers, P. (2002). Why we cannot know complex things completely. *Emergence*, 4(1), 77–84.
- Ford, H. (2015). *My life and work*. New York, NY: Open Road Integrated Media.
- Kurylko, D. T. (2003). Model T had many shades; black dried fastest: Variety of colors vanished temporarily because of the need for assembly speed. *Automotive News*. June 16.
- Lloyd, S. (2001). Measures of complexity: A nonexhaustive list. *IEEE Control Systems*, 21(4), 7.
- Luhmann, N. (1987). *Soziale Systeme: Grundriss einer allgemeinen Theorie* (1st ed.). Frankfurt am Main: Suhrkamp.

- Malik, F. (2008). *Strategie des Managements komplexer Systeme: Ein Beitrag zur Management-Kybernetik evolutionärer Systeme* (10th ed.). Bern, Stuttgart, Wien: Haupt.
- Penrose, E. T. (1963). *The theory of the growth in the firm*. Oxford [England]: Blackwell. (©1959).
- Porter, M. E. (1996). What is strategy? *Harvard Business Review*, 74(6), 61–78.
- Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, 18(7), 509–533.
- Wernerfelt, B. (1984). The resource-based view of the firm. *Strategic Management Journal*, 5(2), 171–180.

VSM in Fifteen Minutes— How Does a Soccer Club Function?

2

*Now, I understand, what the problem
of our national soccer association is!*
(Spontaneous remark by a client after having followed the
explanation of the VSM)

The VSM looks complex when one sees it for the first time. From experience, the fastest and most intuitive way to explain the VSM is by using a simple example: such as a soccer club.¹ We will thereby see how almost naturally and logically the VSM emerges and how well it portrays actual processes in organizations.

2.1 A Team of Players—The Core of the Club

Let us suppose that **a group of youths** in a town regularly gathers to play soccer. Since playing only within the group becomes monotonous over time, this group starts soon playing with other youth teams of the neighboring cities. Graphically, we can represent the youth group and its encounters with other soccer teams as in Fig. 2.1.

Let us further suppose that this youth group becomes so successful that its members start seriously working on their game. Soon, they will discover that they cannot achieve any significant improvements just by themselves. They need someone else who observes them playing (which they cannot do themselves), who can assign the most suitable position to every player, and who develops a professional training plan to improve their strengths and reduce their weaknesses. They will thus **recognize the need for a professional trainer**.

¹ All figures in this chapter related to the Viable System Model and the figurative description of the soccer club are adapted and contain detail views from Beer (1995a: 136, Fig. 37). For the corresponding permission details, see the reference section at the end of this chapter.

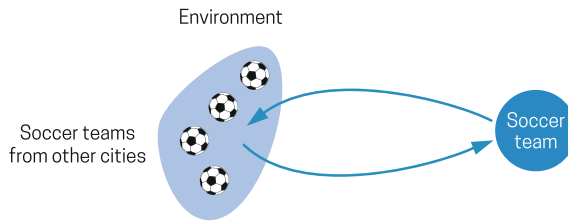


Fig. 2.1 The soccer team encountering other teams

In the graphic language of the VSM, the trainer joins the system as in Fig. 2.2. The trainer increases the team’s *eigen*-variety threefold:

1. The trainer adds a **higher-order perspective** to the group. Through the trainer, the team can observe itself in its entirety, and the trainer lets the team identify playing patterns that none of the individual players can detect (naturally because the players are too focused only on their specific roles and tasks). In brief, the trainer provides an **overview** of the group.
2. The trainer **contributes specific experiences and competencies** to the team. The trainer shows the team how it should work, how each player’s potential can be increased more effectively, and how weaknesses could be corrected. The trainer thus increases the *eigen*-variety of the team (strengths) and reduces unwanted variety (mistakes and weaknesses).

For this, the trainer must know the critical parameters and success factors of a soccer game. Put into a more colloquial language: he must “have a plan” or an “idea” about how a soccer game works, how its dynamics unfold, and how the team can use these dynamics to its advantage. The trainer contributes to the team through his experience, knowledge, or, in a more abstract language, through **models that relate effects to causes**. So, he not only creates an overview but also adds **insight and understanding to the team**.

The quality of his control models will determine how much value the trainer can contribute in the eyes of the players. This, in the end, is one of the key foundations of his legitimacy. He will remain accepted long-term only if he has better explanatory models and designs better strategies and tactics than the players and other trainers. If his models are too weak, he will be ousted very quickly.

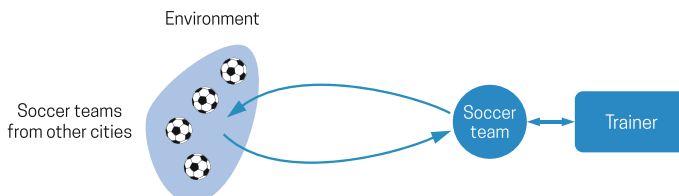


Fig. 2.2 The soccer team with its trainer

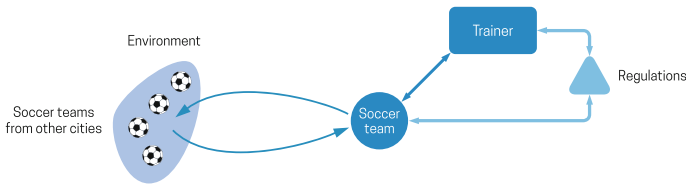


Fig. 2.3 Plans (“regulations”) help to put order into the team’s activities and are an essential part of a team

3. However, models and analysis are not an end in themselves; the challenge consists of finding the **way of how to improve and reach the targets** concretely. The trainer must be able to define training and development plans that allow the team to improve.

The trainer’s plans are like a bridge from the as-is situation to the desired future state. His plans put the team’s training activities into such a factual and logical order so that the team can achieve its objectives. These “**plans**” or “**regulations**”, as they are called in the VSM language, are graphically represented as in Fig. 2.3.

Every trainer lives in a particular tension, which we can easily observe in his body language: he is responsible for the game but cannot or should not participate in the game. The reason for this is the rules and regulations in soccer, but they are also there to help to preserve the value of the trainer. If the trainer joined the players on the soccer field, the team would lose the benefits it gained through him such as obtaining overview and assessments of its performance a diagnosis.

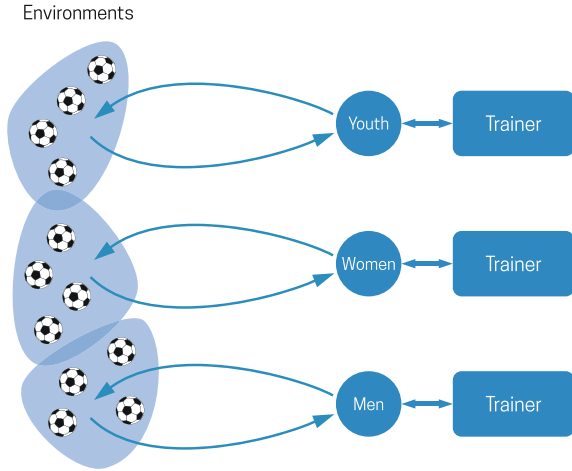
2.2 Growth and the Need for More Coordination

Let us now suppose that the success of our youth team is so overwhelming that other people get attracted to the sport and form additional teams in the city, for instance, a women’s and a men’s team. Graphically, these new teams are represented in the same way as the youth team (see Fig. 2.4).

Since it is not very economical for every team to buy and maintain individual soccer fields, these teams will try to share the infrastructure and form a soccer club. While this joint-venture has clear benefits, it also creates problems: when can which team use the soccer field? In which condition should each team leave the field and other facilities for the next team? Where are the keys to the stadium and other shared facilities? How are costs split up among the teams? However, it is not only sharing resources that creates problems; already the simultaneous existence of several teams might be a challenge: why are players in one team trained differently? Why does one team have more fans than the other ones? Why is the climate in one team better than in the others?

This list of questions can be extended into infinity, but it shows one crucial point: at the moment when several teams or, more generally, several organizational units work together in parallel and interact, **a need for coordination arises**.

Fig. 2.4 A soccer club consisting of several teams (for reasons of simplicity without the regulation triangles)



This demand needs to be satisfied because tensions will otherwise build up leading to sometimes **dangerous oscillations** within the whole organization.

Thus, the teams need to develop **coordination instruments** to prevent these oscillations from emerging. These instruments can be manifold, such as **timetables** that coordinate training and playing sessions. Similarly, **norms and regulations** coordinate the teams' interactions with each other. The rule "Please clean the shower after showering!" makes sure that the expectations of all members regarding hygiene and cleanliness are brought to the same level, and disputes can be prevented (Fig. 2.5). However, also, **the specific language** used by the teams needs to be adjusted: what kind of language and terminology can and should be used within the club and how should the teams communicate with each other? Is shouting and yelling tolerated or not? What kind of swear words are acceptable and which ones not?

Such coordination mechanisms cannot be determined in detail in advance because many of these issues are not known beforehand. For these unknown issues, the soccer club must create **institutional spaces** that make the coordination of new issues possible among club members. Assemblies, annual meetings of the board or just a social meeting room are such spaces.



Fig. 2.5 Signs as this one are intended to coordinate and align human behavior

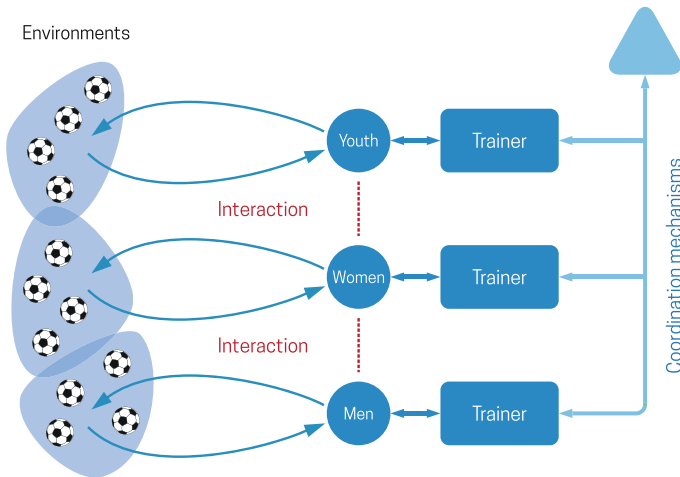


Fig. 2.6 Coordination mechanisms emerge as a result of the interactions between the teams

Variety in a club not only emerges from factual issues but also from **different personalities**. The social part of a monthly or annual assembly at the bar offers club members to adjust their personalities to each other. Entertainment and fun help people to reduce barriers and come closer to each other. This increases the willingness and ability to adjust to each other.

In the VSM, these coordination instruments are represented by a triangle and a channel that connects all teams (Fig. 2.6).

2.3 From Mere Coordination to Control and Optimization

Whoever has already been a member of a club, knows that every club is confronted with two types of problems: first, there are sometimes issues that need to be coordinated, but do not find a consensus. Second, some resources need to be managed and assigned from a more global and synergetic perspective than the individual members typically want to assume.

Let us assume, for instance, that a sponsor is approaching our soccer club and wants to support it financially (Fig. 2.7). The following questions arise almost automatically: how are these donations distributed among the individual teams? Who is responsible for a meaningful and strategically appropriate allocation of these funds? Who defines the objectives that the individual teams need to achieve with these funds? Who holds the teams and their trainers accountable?

The allocation of resources such as money, staff, but also time and space thus require **a different perspective**, namely one that looks at the entire club as opposed just the individual team. Until now, the teams needed to care only about themselves

Fig. 2.7 Who is responsible for the allocation of resources? (© Fotolia/stock.adobe.com; artist(s): vchalup)



or, at best, about their interactions and interfaces with other teams. Coordination among the teams as such does not address these questions sufficiently because the individual teams will most likely seek just a minimum amount of coordination. Typically, one cannot expect that they are particularly receptive to additional synergies that could be gained by a broader and deeper integration.

Thus, the club needs to develop and institutionalize **a new function that manages and controls the whole club, integrates the individual teams**, and searches for as many feasible **synergies** as possible: the operational control and synergies function (Fig. 2.8).

What are the specific tasks of this new function? For our soccer club, these are, for example:

- ... **allocating resources**, e.g., training budgets for the trainer and the acquisition of players,
- ... **implementing synergies**, e.g., in marketing, PR or the use of the club's infrastructure,
- ... holding the teams and trainers **accountable** with regard to the allocated resources, and
- ... **deciding conflicts** that teams cannot solve among themselves.

Depending on the issues' urgency and scope, the club will either appoint individuals such as a club manager or a group of individuals (e.g., a board) to take over this function.

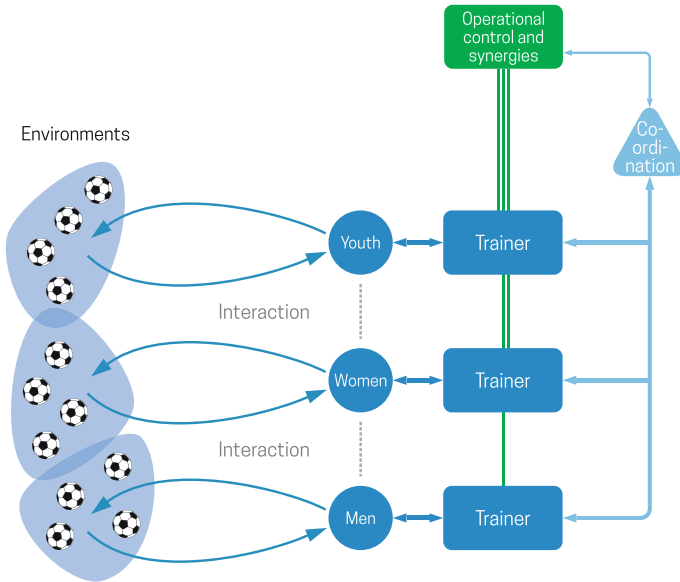


Fig. 2.8 The “Operational Control and Synergies” function

2.4 Trust Is Good; Control Is Better

The allocation of resources causes a problem: how reliable are the reports by the trainer and teams regarding the use of the entrusted resources and the achievement of the agreed objectives? In our current model, the operational control and synergy function only has the information channel to the trainers. Hence, it depends on the information provided by them.

The operational control and synergy function will consequently attempt everything to overcome its information deficit and to get firsthand information about the teams’ performance. In our example, the club manager or the board will visit the games themselves or show up unannounced at training sessions. In doing this, they are exercising a new systemic function different from all other functions we have seen so far: the **auditing function** (see Fig. 2.9).

Auditing is a function needed to not only overcome information deficits but also to initiate and undertake optimization projects not executed by the lower organizational units.

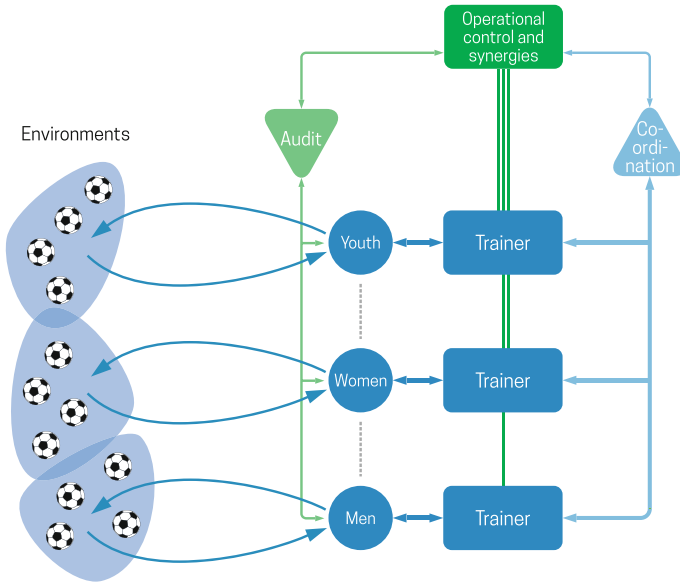


Fig. 2.9 The “Auditing” function

2.5 What Will Bring Us the Future?

The auditing function is not the only function still missing. Our model of the club has two specific shortcomings:

1. So far, we have considered just the **specific and narrower environments** of the individual teams.
2. We have ignored **time**: organizations do not only operate in the present, but they also face an approaching **future**, which is almost unknown and can only be guessed to a certain extent.

In our example, it could happen, for instance, that the country’s federal sports budget is cut down. It could even occur that other sports become more popular and attract better young talent, a larger audience, and more sponsors than soccer. For our soccer club, this creates the challenge, of how to better anticipate these new developments and trends in the wider environment, in order to develop timely responses to these changes.

The functions that we have identified so far cannot take over this task. They are concerned with and focused on managing the current club’s activities and operational challenges. For the new and barely known challenges, the club must set up a new function that is specifically targeted at the wider environment and the future (Fig. 2.10).

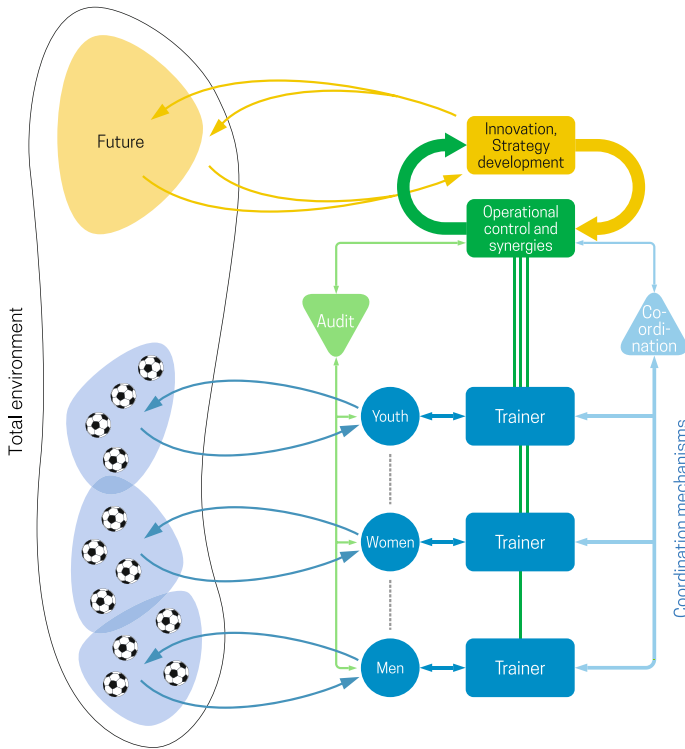


Fig. 2.10 The “Innovation and Strategy Development” function

If you regard Fig. 2.10, I invite you to imagine, respectively, think through the **relation between the operational control function and the innovation and strategy development function**. Will it be a harmonious or rather a controversial one? Let us take our example: the board of the club recognizes that another sports discipline becomes attractive. It will then ask itself, how to react best to these new developments. Should we remain a soccer club or should we instead transform the soccer club into a more general sports club that welcomes other sports disciplines? It is not easy to answer this question because the second option requires changing the way the club is managed, coordinated, and controlled. Moreover, it will change the club’s identity and values.

Such a change and the ensuing discussions go to the heart of the soccer club, but they are essential, since they decide, whether and how the club adapts and remains viable. Stafford Beer called this exchange between the two functions the **“the organ of adaption”** (1995a: 120); it is the **engine of change** from the club’s current status to one of its possible future ones. Since this exchange is so vital to the organization, Stafford Beer added two big arrows going from the side of one function to the other.

2.6 What Are Our Mission, Values, and Principles?

The dispute between the status of the organization and its probable future states causes **three problems** to emerge that require a further function:

1. For the long-term survival of the club, it is essential that the representatives of the different perspectives discuss the issues on an equal footing. Neither the soccer purists should dominate beforehand the discussion, nor those who represent the new sport. If the soccer enthusiasts prevail, this will imply that the club's past and present inhibit any further development and change. In the opposite case, the club would rush prematurely into new adventures and thereby eventually destabilize the club. The club could then run the danger of changing too often. When making this crucial decision, the club must distance itself from both perspectives and consider them as much as possible equally. It needs someone **neutral** for this kind of questions and who can moderate between the different perspectives.
2. The club also wants to obtain **stability** through its decision. The final decision on a matter should last long and not change fast and frequently. The club does not want to fall victim of fashions and trends. Only these “everlasting” principles will give the organization the necessary certainty: “What is this debate really about? What unchanging insights and experiences can help us to make a decision that will withhold changing circumstances and preserve our club's long-term viability?”

The club needs a circle of people who develop, define, and keep an eye on the underlying fundamental principles for such decisions.

3. In the end, the club must also **make sure that a decision is made**. In the club, there must exist an institutionally recognized authority that finally decides if a consensus cannot be found and whose decisions are accepted by the entire club. This is important because the organization otherwise remains divided and eventually becomes paralyzed: neither will the new sport be established nor will the soccer teams be developed, since funds will remain frozen until a final decision can be reached. To remain viable and functioning, the soccer club thus needs to make a decision on its future direction and identity—no matter which one.

These three problems necessitate an additional function, which develops and decides on the principles, rules, norms, policies, and the general direction of the club (Fig. 2.11): the “Policy- and Norm-setting” function.

Who makes this kind of decisions and who exercises this type of function? In our examples, this will be the club's board, but not always: a board may find that a decision is too fundamental and that it needs the support of all club members. Then, the decision will be taken by a vote in a general assembly. By whatever processes the club makes the decision, it will allow the club to close an open issue that prevents the rest of the organization from “returning to normal” and resuming its regular activities. If this decision is made, then no further function is needed; everything else can be taken over by the functions that we have discussed so far.

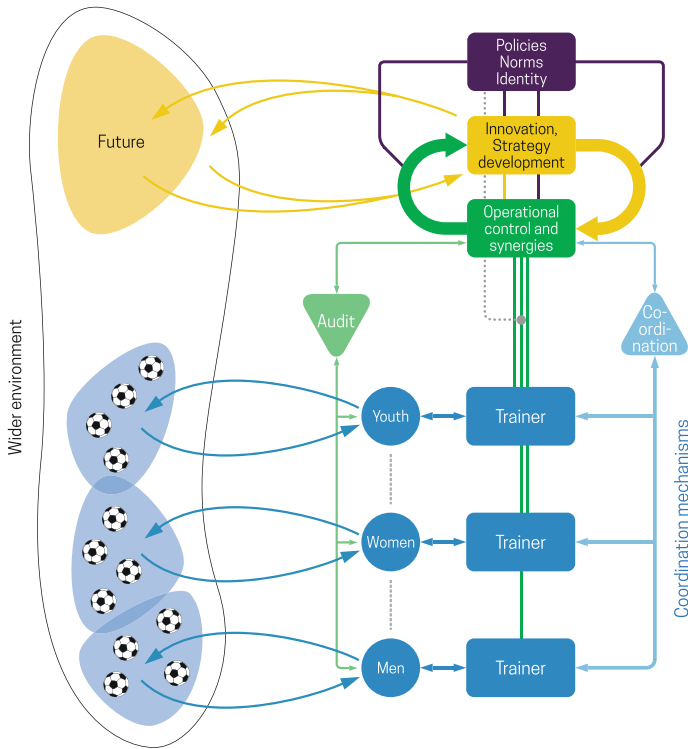


Fig. 2.11 The “policy- and norm-setting” function (adapted from Beer (1995a: 136, Fig. 37))

2.7 The Viable System Model

For Stafford Beer, the functions mentioned above describe not only a club but all the elements that are necessary for every kind of organization and its viability. None of these functions should be missing. Stafford Beer called these functions “**system functions**” as they are necessary for the functioning of the social system “organization”. Since “system functions” is a long word, they are normally just called “systems” (as we will do from now on in this book). In its generalized form, the VSM appears as in Fig. 2.12.

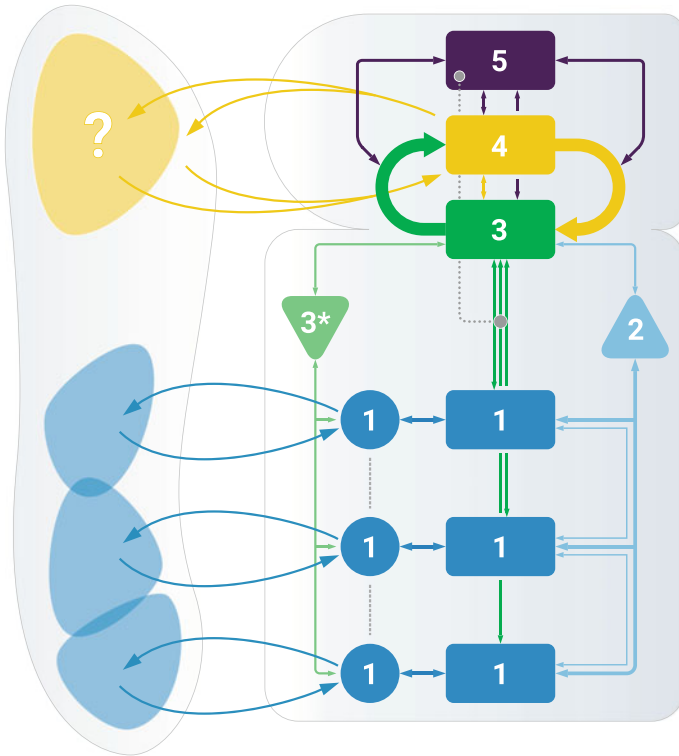


Fig. 2.12 The VSM (in its general form) (adapted from Beer (1995a: 136, Fig. 37))

The VSM consists of five such “system functions”² (Table 2.1):

Table 2.1 Synopsis of the VSM’s system functions

System function	Description	In our soccer club example
System 1	Implementation of the organization’s operational purpose	<ul style="list-style-type: none"> • Purpose: playing soccer • Operations: soccer team • Management: trainer
System 2	Coordination and anti-oscillation of the systems 1	Timetables, rules, social club meetings
System 3	Integration, managing, and controlling resources, as well as creating synergies	Allocation of sponsoring funds
System 3*	Auditing	Unannounced inspections of training sessions and games
System 4	Innovation and development of new strategies	Development of new strategies
System 5	Long-term policies, norms, principles, and policies	Defining the club’s identity

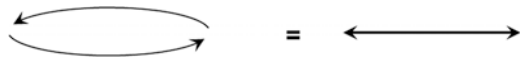
² For historical reasons, system 3* is counted together with system 3.

At this place a few comments regarding the **graphical form**:

First, for reasons of clarity and usability, the local regulatory centers of the systems 2 (small triangles) are not always shown. System 2 is mostly represented by just one triangle, namely, the one at the corporate level, and the channel connecting the systems 1. Arrows between the systems 1 have been added to the original model to represent the (implied) self-coordinative character of system 2.

Second, for reasons of graphical simplicity, curved arrows symbolizing the exchange of varieties are only shown for the interactions with the environment and between systems 3 and 4. Otherwise, we use straight arrows, which have the same meaning. Apart from the exchange of varieties, the arrows also stand for the underlying information channels (Fig. 2.13).

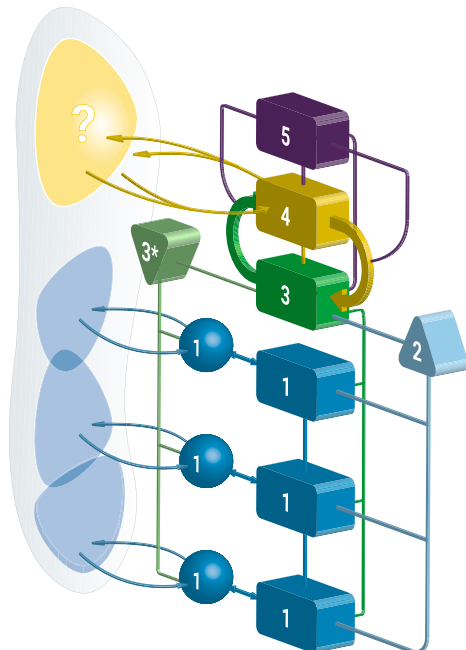
Fig. 2.13 Straight arrows always signify the exchange of varieties



Third, in the two-dimensional form, it seems that the vertical channel goes from one system 1 into the next one before finally reaching system 3. In the three-dimensional form (Fig. 2.14), we see better that all systems 1 are individually connected to system 3 without passing through another system 1. Figure 2.14 also shows the channels connecting the system 1 management units, which we omit in the two-dimensional representation of the VSM for reasons of graphical simplicity.

We will address the specific **conceptual perspective of the VSM** later in greater detail, but what immediately springs to mind is that the VSM does not portray an organization in conventional categories such as jobs, positions, and organizational

Fig. 2.14 The VSM three-dimensional (adapted from Beer (1995a: 136, Fig. 37))



units or corporate functions such as production, finance, or sales. This view is a bit unusual for us but comes from Beer’s insight that the tasks of the different corporate functions can be further generalized from a systemic perspective.

If we take, for instance, personnel planning, budgeting, or production planning, we can easily see that these processes differ in their factual content, but not in their systemic, i.e., organizational function. Planning is the same for all corporate functions, namely defining the future course of action, allocating resources, deciding the required level of synergies, and coordinating activities. These activities are systemically all identical for all corporate functions.

This conceptualization offers an advantage as we will see: one can generalize organizational structures better across diverse types of organizations than with the conventional language of the organizational chart and thus make them more comparable. In volume 3 we will come back to our traditional image of an organization and its corporate functions. We will then see how the VSM can be translated into our conventional image and how it can be used to design and model organizations more effectively. This generalization indeed pays off.

2.8 The VSM’s Logical Management Levels

If we look more closely at the VSM, we see that an organization can be divided into **four distinct logical management levels and control loops** (see Fig. 2.15 and Schwaninger 2006: 82f):

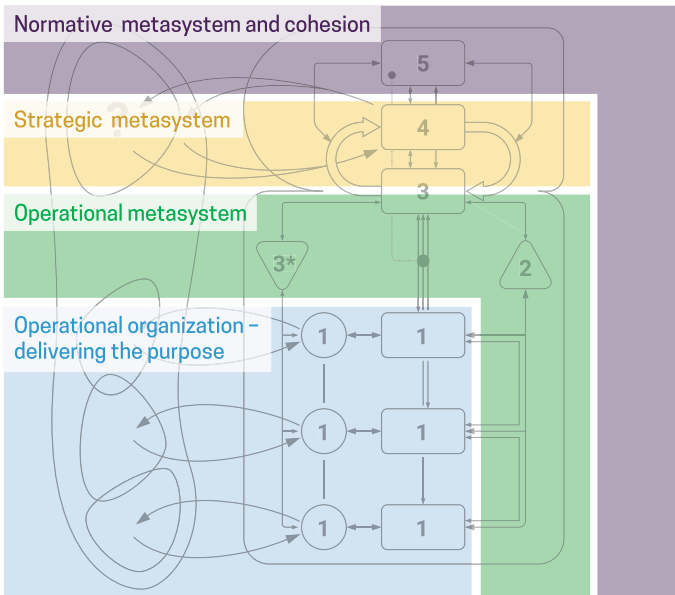


Fig. 2.15 The four management levels in the VSM (contains adaptation from Beer (1995a: 136, Fig. 37))

The **first management level** is constituted by the systems 1. It consists of their operations that deliver the purpose(s) of the organization, as well as of their regulatory center and management. The systems 1 form the **operational part of the organization**.

The **second management level** (“operational metasystem”) results from the organization’s intention to control multiple systems 1 and to integrate them into a larger unit. It comprises systems 2, 3, and 3*.³ Its time horizon is the present or immediate future.

The **third management level** consists of the strategic side of system 3 and system 4. This level focuses on the wider environment, the future, and the necessary strategic changes and adaptations and thus forms the **strategic metasystem**.

The **fourth management level** comprises system 5 as well as its algedonic channel to the operational organization. This level is called the **normative metasystem**. Its time horizon is, in a way, the negation of time or temporariness; it searches the principles and norms that transcend time and are valid across time. The normative metasystem is also responsible for the cohesion of the entire organization and has as such a final integrative function within the organization.

How do we proceed from here in this volume?

First, we will discuss the four management levels in greater detail, to understand better the functioning and principles of organizational viability. Once we have sufficiently mastered the VSM, we will then address the question of how the VSM

³ For a similar grouping see Pérez Ríos (2012: 101). A question that is not yet decided among VSM experts is, to what extent systems 2 and 3* belong to the metasystem. Stafford Beer is in this regard not very clear himself. In a stricter sense, the metasystem comprises only systems 3, 4, and 5 (e.g., in Beer 1995b: 201, Fig. 31 or Beer 1995a: 129). At other occasions, however, system 2 is an element of the metasystem (e.g., Beer 1995a: 136, Fig. 37).

One reason for this lack of clarity seems to lie in the double function of system 2 (see Sect. 4.2.5), which assumes a metasystemic function, but is at the same time a service to the systems 1. (Beer 1995b: 201). In the end, it also appears to be a question of how “metasystemic” is defined. If “metasystemic” is understood in a wider sense (Beer 1995b: 116) then, metasystemic are all activities that are necessary for the management of a *group* of operational units (in contrast to the management of the individual units). In this sense, system 2 is part of the metasystem. Even the self-coordination process of the systems 1 can already be considered as metasystemic (Beer 1995c: 172). If we understand “metasystemic” in a narrower sense and restrict it to strategic decision-making, then it is not part of the metasystem.

We face a similar difficulty concerning system 3*, which has made its appearance only from *Diagnosing a System* (Beer 1995a) onward (before that, it has only been portrayed as the loop of system 3 to the operations). The reason might be as well its double function: System 3* works best apart from the central command channel of the systems 3, 4, and 5 complexes (see Beer 1995a: 86). However, for Beer system 3* remains an important help and sub-function of system 3 and cannot be separated from it (ibid).

In this book, we follow the wider interpretation of “metasystemic”, since systems 2 and 3* regard the operational organization from a holistic perspective, which sets it clearly apart from the systems 1’s individualistic perspective. Hereby, we follow Pérez Ríos (2012) who distinguishes between the “Management (Metasystem)” consisting of systems 3, 4, and 5 but who also attributes systems 2 and 3* in his graphical representations of the VSM to the metasystemic area (see Pérez Ríos 2012: 87).

can be applied to larger organizations with multiple hierarchical levels. The guiding term will be “recursivity.” We will see how this strange term can lead us to valuable insights regarding the functioning of hierarchies.

Then, we will discuss the vital role of information and communication for the management of organizations. This will also open us a perspective on the role and legitimization of power in organizations. Finally, we will make the VSM more concrete by illustrating some real-life examples.

Summary

- The Viable System Model (VSM) describes organizations as a system regulating the processing of variety. It consists of five system functions (incl. system 3*).
- These system functions can be grouped into four interconnected logical management levels: delivering the purpose, the operational, the strategic, and the normative metasystem.
- In the VSM, organizations are not described in terms of people, jobs, positions, or corporate functions, but by the systemic functions that are necessary for the functioning and viability of the entire organization.

Questions for Reflection:

1. Try to map a club, association, or group that you know into the VSM. What are its system functions?
2. Try to identify the system functions in your area of responsibility, e.g., in your team or department:
 - a. What is part of the system 1, i.e., what produces or helps to produce the purpose of your entire organization?
 - b. What are system 2 processes and activities?
 - c. How does the interaction between systems 3, 4, and 5 work in your organization?
 - d. What is system 3*, respectively, what are the auditing and optimizing operational processes in your organization? How well is system 3* working in your organization?
3. Does your area of responsibility function in a stable way? If not, which system function is probably not working or which system functions do not interact with each other properly?

References

- Beer, S. (1995a). *Diagnosing the system for organizations*. Chichester [West Sussex], New York: Wiley. (Figures 7, 35, 36 and 37 republished with permission of John Wiley and Sons Inc. and the permission conveyed through the Copyright Clearance Center, Inc.).
- Beer, S. (1995b). *The heart of enterprise*. Chichester [England], New York: Wiley. (Figures 21 and 51 republished with permission of John Wiley and Sons Inc. and the permission conveyed through the Copyright Clearance Center, Inc.).
- Beer, S. (1995c). *Brain of the firm* (2nd ed.). Chichester, England, New York: Wiley.
- Pérez Ríos, J. (2012). *Design and diagnosis for sustainable organizations: The viable system method*. Heidelberg: Springer.
- Schwaninger, M. (2006). *Intelligent organizations: Powerful models for systemic management; with 6 tables*. Heidelberg: Springer.

The Product— Core and Foundation of the Organization

3

“By their fruit, you will recognize them.”
Bible, Math. 7,16

In an organizational chart, units appear to hang down undifferentiated from a clothesline. However, where does an organization start and where does it end? Has an organization a center of gravity? Is it the top of the organization as the organizational chart suggests or something else?

These are not irrelevant questions because the way we answer them influences our fundamental understanding of organizations and the internal logic of how an organization functions and should be designed. What then is the VSM’s opinion on these questions?¹

3.1 The Systems 1—A Programmatic Statement

Peter Drucker, one of the most influential thinkers on management, once made a very simple and almost obvious, yet fundamental remark: “The customer is the foundation of the business and keeps it in existence. He alone gives employment” (Drucker 1993: 61) and “It is the customer who determines what a business is. (..) What the customer thinks he is buying, what he considers value, is decisive—it determines what a business is, what it produces, and whether it will prosper” (*ibid.*).

¹ All figures in this chapter related to the VSM are or contain, with the exception of Fig. 3.2 and if not stated otherwise, adapted detail views from Beer (1995a: 136, Fig. 37). For the corresponding permission details, see the reference section at the end of this chapter.

What an organization is and why it can exist, is based on the value that it creates for its environment through its products. In its products,² its “fruits” so to speak, the outside world meets the organization; **in its products and services, the organization becomes visible and tangible to the environment.** In this exchange process between organization and environment lie the foundation and center of every organization. Through this process, a company becomes a company and the customer a customer. In this exchange process, the boundaries and roles of both are defined.

This **process is bidirectional and iterative**: the customer defines the organization by his or her choices and value preferences. However, we only become customers if we see products that we can and want to buy. The products shape us. They determine what kind of customers we are and what kind of preferences we develop. In this sense, Peter Drucker could indeed state that it is the purpose of a business enterprise “*to create a customer.*” (*ibid.*), since the customer is only created through the products of the organization, and through this, in turn, the organization also becomes what it is and remains in existence. Thus, **in this exchange process lies the foundation of an organization and from there the description and design of an organization must start.**

Stafford Beer had a view similar to Peter Drucker’s. For him, an organization starts where and when it creates the purpose and benefits for its environment. Consequently, an organization begins and is based on all those activities that produce the “product” of the organization and make it available to the environment, i.e., its market. These activities form the foundations, on which the entire organization rests. They constitute the organization’s primary system function; they form the **system number one**. All other (system) functions in an organization are “just” built upon these primary activities.

This also explains why the system functions in the VSM are counted from the bottom to the top. The numbering method in the VSM is no coincidence; it is a program: organizations start with those units that concretely produce and deliver the products of the organization and generate its purpose as defined by the organization.

However, what is the concrete purpose of an organization? For a typical manufacturing company, the purpose is its products. For a school, it is the transmission and acquisition of knowledge and competencies by its pupils. For a logistics company, the purpose is the physical transport of people and goods. For a consultancy the purpose is its projects and for a law firm its client cases. This type of activities constitutes the core and center of the organization, and hence the systems 1 of that organization. All other functions and upper hierarchical levels such as product or business units or divisions are resting on them (for more details see Chapter 10).

² Not all organizations have of course “products” and “customers” as understood in the private sector, of which Peter Drucker was speaking here primarily. For public sector, nonprofit or religious organizations, these terms must be used with caution. This, however, does not alter the described fundamental relationship of an organization that consists in producing value for an environment and that the latter needs to recognize as such.

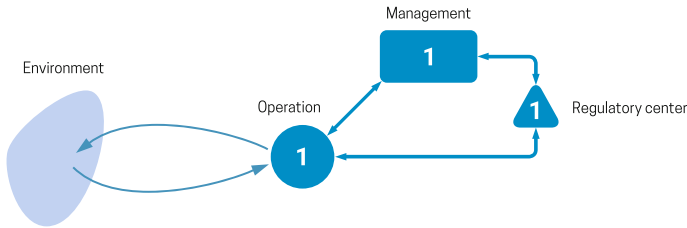


Fig. 3.1 Elements and structure of a system 1

Each system 1 consists of four elements³ (see Fig. 3.1):

1. The environment,
2. The operation,
3. The regulatory center, and
4. The management of the system 1.

Why these elements and how do they function in detail? This question will be the focus of the remaining chapter.

3.2 The Environment of System 1

The systems 1 are confronted with many different environments, but not all are equally important. The **primary environment** of the systems 1 is their relevant product markets and clients because for them the organization generates its purpose. The first and most important variety that an organization must process,

³ Several interpretations can be found in the VSM literature concerning the precise content and scope of system 1. In some interpretations (mainly following Beer 1995c), the term “system 1” only encompasses the management function that regulates the operation (see, for instance, Malik 2008: 105; Schwaninger 2006: 82). Schwaninger (2006: 82ff) then defines the set consisting of the operation (“basic unit”) and its management (“regulatory capacity”) as “primary system”. In Beer (in 1995a and b), the term “system 1” refers to all these sets, i.e., all systems 1 in our terminology (Beer 1995a: 56, b: 132 and 147, Fig. 28; equally, Pérez Ríos 2012). The system 1 as used in this book is called the “three operational elements” (Beer 1995b: 121). Sometimes however, Beer also appears to use the term “system 1” in our and narrower sense for the individual set (e.g., 1995a: 52.95–97). Malik (2008: 140–145) also sees the VSM composed of several systems 1 instead of one. The reason for the interpretation chosen in this book (see also Beer 1984) is that first, in our experience, it is more parsimonious regarding the terminology and facilitates the explanation of the VSM. Second, it also emphasizes more specifically the aspect of individuality that becomes introduced by the systems 1 into the organization. This helps to better elucidate the specific task and challenge of the metasytem to form out of the individual parts a coherent and greater system. By naming all these lower-level operational systems with the same term, “system 1” and by using the same color, we hope to sufficiently express the aspect that all systems 1 also form a distinct type and group of systemic function setting them apart from the metasytemic functions.

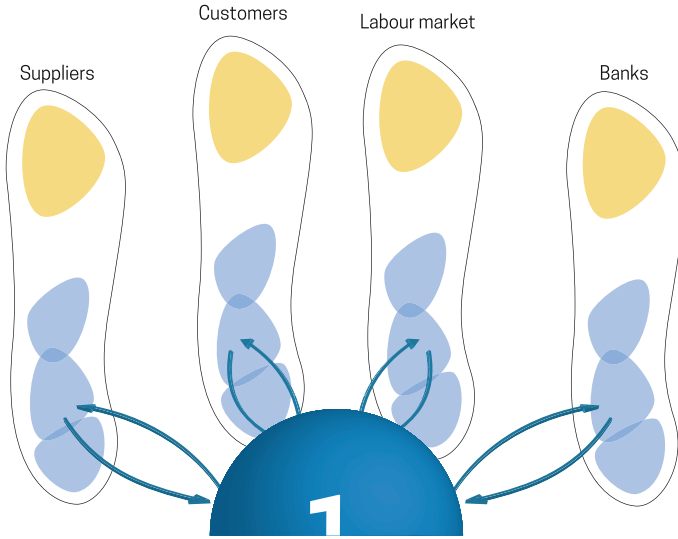


Fig. 3.2 Environments of a system 1 (perspective from the system 1's management)

consequently, is the variety of its primary environment, i.e., its markets and customers. Consequently, the organization must be designed in function of and starting from its exchanges with its primary environment.

There exist, of course, other relevant environments as well such as suppliers, banks, labor markets, and public sector institutions (see Fig. 3.2). They are also important, but they do not constitute the environment, on which the life and viability of the organization are based; they are only **secondary environments**.⁴ Problems in an organization's viability can arise, precisely if this order is reversed: for instance, if banks, public sector institutions or suppliers become more important than customers. In these cases, the secondary environments become the primary one.

We discuss quite easily the relationship of a company to its markets and clients, thereby unconsciously assuming that this relationship is the most natural and self-evident one in an organization. However, is this view correct? If we take a closer look at real life, we discover that sometimes a considerably thick fog separates both. The environment and the organization are confronted with the challenge that **they do not know each other**. Neither does an organization fully understand its environment nor has the environment a precise idea about the organization and how it functions. In 2017, the French edition of the Harvard Business Review made the question “What do our clients really want?” as the

⁴ The exception is, of course, these organizations, for which these so-called secondary environments are the primary clients, e.g., a software company producing software for banks or public institutions.

cover story of one of its issues (*Harvard Business Review France* 2017). Environment and the organization are fundamentally not transparent to each other.

Not convinced? Let us briefly reflect on how many activities would not exist in a company if the environment were completely transparent to the organization. Market research, PR, promotions, visits to fairs, sales analytics, etc., are all instruments designed to get to know and understand the market and its customers, to increase awareness and visibility and to enter into a dialogue with the customer.

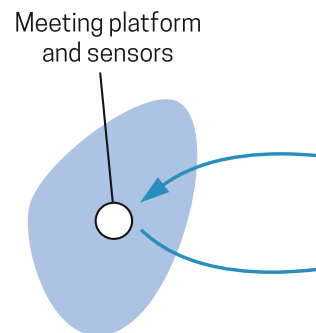
The same is true for the customer: he or she must also search for the company and its products. Only through product catalogs, websites, talks with sales representatives or visits to a fair can a customer learn about the organization. “What you cannot see, is not there” is a known saying in marketing. A product and consequently its producer exist only for the customer if he or she can see it. Visibility is hence the most important objective at this stage!

For this reason, organizations need to establish **meeting points and platforms** (Fig. 3.3), where they can enter into contact with their environment and inform the environment about themselves. These places can take multiple forms: shops, trade fairs, visits by sales representatives, websites, customer events, clubs (e.g., book clubs, fan clubs, gaming clubs). Even mailing actions belong to this category, as they attempt to make the environment and organization visible to each other. These meeting points and platforms are an essential part of the organization and should be an element of any organization model.

Establishing meeting points sounds relatively simple and straightforward, but whether environment and organization succeed in meeting each other also depends on whether their (*eigen-*)varieties correspond to each other. Sounds perhaps still abstract, but the simplest example of this is a situation that many of us have already experienced: when you enter a shop and no sales representative is available. You wait a little longer, but after 15 min of not being served, you decide to leave the shop. The shop could not fulfill your expectation regarding the service level. The *eigen-*variety of the shop did not match the variety of the environment (me as a customer)—to put it into the parlance of Ashby’s Law.

This was a simple example, but matching the environment’s variety becomes even trickier for organizations if we include **the cognitive dimension**: can we catch the customer’s attention, can we strike his or her nerve, are we within the range of

Fig. 3.3 Meeting platforms and sensors to the environment are important elements of an organization



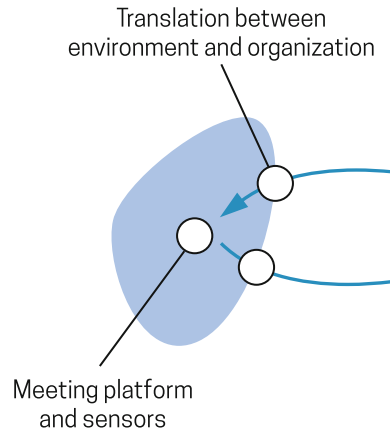
his or her perception? What does the customer want? This is not a trivial issue, but almost a matter of life and death: if the organization cannot grasp the variety of its customers and the environment in general, it will not be able to adjust to them according to Ashby's Law and will eventually fail.

For this reason, organizations like the human body need not only meeting points and platforms but also **sensors that gather information about the environment**. The capability of these sensors to capture signals from the environment fully and correctly (e.g., what customers want and need) and to transmit them into the organization ultimately decides, how an organization can adjust to the environment and process the environmental variety. If the sensors are not able to receive signals or if they interpret and transmit them incorrectly, then an organization becomes much like a car with a falsely calibrated electronic stabilizing system or autopilot. As a result, it cannot adjust correctly to road conditions and loses its direction and stability. The wrongly interpreted signal sends the car off the road.

Similarly, an organization will then take actions and send out messages that its environment and customers cannot understand. The sensors of an organization are hence a critical part of an organization and must be placed appropriately (where they can receive information), continuously calibrated and trained. Only then, will an organization be able to understand and match the environmental variety.

However, sensors are not enough: have you ever read a product description, advert or product manual that you could not understand or only incorrectly? Not only must every organization collect information but it must also perform another essential task: **it must translate between its language and the language(s) of its environment** (see Fig. 3.4).⁵ If its translation capacities do not have requisite

Fig. 3.4 The translation between the environment and the organization is a critical element in the adjustment process



⁵ In this graphical representation sensors and translators have been separated to show that the translation occurs at the boundary between the environment and the organization. In reality, they can fall together, i.e., those sensing the information translate it also at the same time into the language of the organization.

variety, then misunderstandings and deceptions will occur in the dialogue with the customer.

If we consider how quickly communication can become ambiguous because everyone has different experiences, knowledge or is living in different contexts, we can then easily and quickly understand, how immense and daunting this translation task is. It is perhaps more likely that one will not understand another than reaching a common understanding (see Luhmann 1987: 165ff). No doubt among many other things, the viability of organizations depends on its capacity to translate the messages from and to its environment. Moreover, this translation capacity requires intense and continuous training, feedback loops, and the use of experts who help that the requisite *eigen*-variety needed in the communication with the environment is attained.

3.3 The Operation— The Place, Where “The Real Work Is Done”

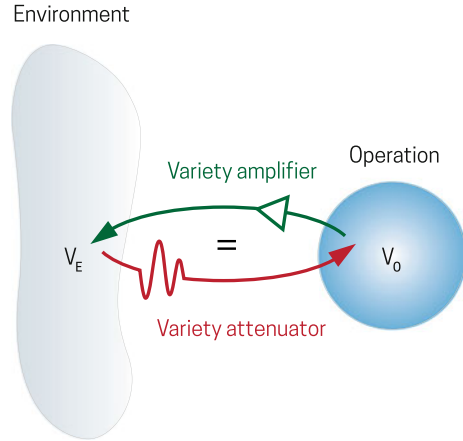
The operation encompasses all activities and processes that are directly related to the production of the organization’s purpose, whether it be a product or service. If we hear the term “production processes” we immediately think of production halls, machines, and assembly lines. However, the “production” of purpose can occur in many more manifold ways such as giving advice (e.g., lawyers, consultants), assisting people in and with specific activities (e.g., nurses, drivers, movers) or even just by making spaces, resources, and infrastructures available to customers so that they can use them themselves (e.g., fitness studios, tennis clubs). Online platforms also belong to this latter type of “production” processes that bring resource owners together with those who want to access these resources (e.g., Airbnb).

What is relevant to the VSM are not the individual production processes as such, but rather whether the *eigen*-variety of the production (or: “operation”) and the environmental variety are in equilibrium or not. The operation must use production technologies, processes, and resources that ensure a product and a product quality matching the expectations of the environment. Process engineering and quality management are the organizational processes that monitor this part of the equilibrium. They try to adjust the *eigen*-variety of the operation, if and how needed.

This **equilibrium between environment and organization is multidimensional**: it encompasses the physical production, delivery, and installation of the products, the payment process between customers and the organization, as well as the information exchange (e.g., through an online catalog or email exchanges). All these different dimensions of the relation between the organization and the environment are subject to the requirements of Ashby’s Law and must comply with it (see also volume 3).

To calibrate the relation and to achieve equilibrium, the organization employs **variety amplifiers** (such as PR campaigns) and **attenuators** (e.g., general terms and conditions, payment standards). They stimulate the expectation of the market or

Fig. 3.5 The equilibrium between the operation and environment (adapted from Beer (1995b: 96, Fig. 21))



reduce it to the level that the operation can fulfill. In the VSM (see Fig. 3.5), the relation between environment and operation is represented by two arrows that symbolize the variety emanating from the environment and streaming into the organization and, conversely, the variety originating from the organization and directed to the environment.

3.4 The System 1 Management

Today almost everyone is a manager, but what is “management” especially from an organizational-systemic perspective? We can shed some light on this question using Stafford Beer’s approach:

3.4.1 The Three Systemic Tasks of the System 1 Management

In the VSM perspective, the core responsibility of the system 1 management is to **monitor, adjust, and control the relation between the operational organization and the environment**. Similar to a trainer (see Chapter 2), the management of system 1 must guide and prepare the operational organization in its daily task of processing environmental variety.⁶ For this, it has to calibrate the *eigen*-variety of the operational processes of system 1 (operations, channels, and interfaces to the environment) continuously with the environmental challenges, e.g., by hiring more staff, if demand increases or by upgrading machinery, if the product quality needs

⁶ The VSM focuses in particular on the relation between management and the operation. But of course, the management is not only responsible for the operations as such, but for the whole interaction process from and to the environment. Hence, the management does not only address production related issues, but also questions related to sales, logistics, finance, etc.

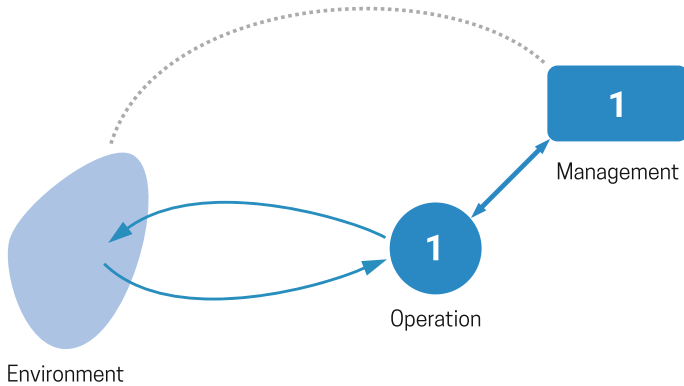


Fig. 3.6 Management needs to regulate and control the variety of the operation (adapted from Beer, 1995a: 27, Fig. 7)

to be improved. Consequently, the relationship between management and operation is also represented by an variety exchange arrow as shown in Fig. 3.6.

To become truly the management of system 1, it must accomplish at least the following **three distinct systemic tasks**⁷:

1. Generate an **overview** allowing to view the system 1 in its entirety (“**overview**” **function**).
2. Develop a **control model** of how the system 1 is functioning and how it should be controlled (“**insight**” **function**).
3. **Adjust the *eigen-variety*** of the operational organization (“**variety management**”) to the challenges of the environment.

Every management will be tested with regard to these three tasks and whether it has the necessary competencies. Only, if the management accomplishes all these three tasks will it become and be accepted as the management of system 1—both in the eyes of its subordinates as well as by the metasystem (see next chapters).

One word regarding the management’s relation to the environment: the organization’s most intense contact with the environment goes through the operation (product and its delivery). For reasons of simplicity, the VSM only shows this contact. As we will see later when discussing the recursivity of organizations (see Chapter 10), the management also has channels to the environment. In Fig. 3.6, these channels are depicted only as a punctuated line.

⁷ I here refer to some of Stafford Beer’s elaborations on the specific functions of the metasystem such as providing a higher order perception and logic, as well as developing a control model following the Conant–Ashby theorem however limited models always will be (see Beer 1995b: 68 f.80). Due to the organization’s recursivity, this applies not only to the metasystem but also of course to the system 1 management (for more on recursivity see Chapter 10).

**Do you want to know more about the above mentioned three tasks of the system 1 management?
If so, then continue here, otherwise, proceed to Section 3.4.2.**

1. Creating an overview

“Who cannot see the wood for the trees” has already lost out (Fig. 3.7). The management of system 1 is tasked with making “the wood” recognizable for the operational organization and to create an overview within the organization. What are the important and salient issues? The management needs to find an answer to this question.

An overview is critical as it provides the basis for orientation. It allows putting different issues into a proper perspective, prioritizing them and finding the right way through the jungle of different pieces of information and demands.

The management who loses “overview” jeopardizes its legitimacy. Hence, it belongs to one of the crucial mistakes of management to relinquish this **overview function**: as a soccer team would lose long-term if the trainer always played on the field, it is equally fatal for an organization, if its management takes over too many operational tasks.

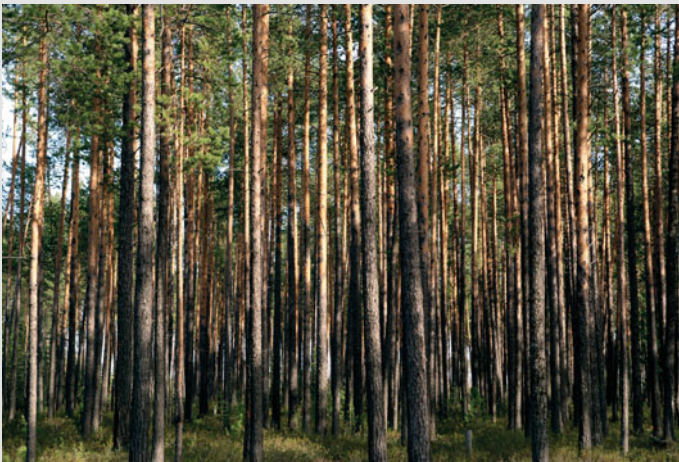


Fig. 3.7 Management must make the “wood” transparent among the trees (© Fotolia/stock.adobe.com; artist(s): Vlad)

The technical director of a paper producer loved to spend a fair amount of his time repairing the paper machines. He was very passionate about working hands-on, if possible, with the tools in his hands. This was probably good for the paper machines, but for the entire company, this behavior created huge gaps at the strategic level. The company lost sight of the bigger picture, and in the end, was taken over by a larger producer.

Refraining from getting too involved in operational matters is not always easy. People who have been promoted from operational into management positions often have difficulties saying farewell to their former tasks. From a human perspective, this is easy to understand: one is used and conditioned to old tasks and responsibilities, and for the new tasks one does not often feel entirely ready. At the start of a new management position, one often lacks the “requisite *eigen*-variety” and hence finds it easier and more tempting and satisfying to continue with one’s old tasks, which one masters.

However, the source of this problem also lies in the rest of the organization. A promotion creates a gap in the organization that needs to be filled up. When someone gets promoted, there is often no one who really can immediately replace the person promoted. So, it is tempting to continue approaching the newly promoted employee with the problems of his or her former position. This behavior, however, cements the old structure. The rest of the organization must hence understand that it needs to close the gap by increasing its *eigen*-variety. This requires adapting, learning, and the acquisition of new competencies, and who wants this? It is always easier to go to the recently promoted to solve a problem than to learn how to master the problem oneself.

Promotions hence require a learning process on both sides, the one who is promoted and the others who must fill the gap. Organizations must ensure that this learning process is consistently carried out.

2. Developing a control model of the organization (“insight”)

Not only must management provide overview but also “insight”. Management must be able to create control models and logics that explain causalities within the managed area. It needs to be able to explain, how its area of responsibility functions and how it can and should be controlled, adjusted, and further developed. Such models are critical for the management to fulfill its function.

The opposite of this is management without a plan and understanding what it is managing (Fig. 3.8). In such situations, the actual management and its legitimacy will become quickly questioned. The better the management understands the challenges of the operation, the better it can accomplish its management function and the faster it will become accepted (Beer 1995b: 80). This also has an impact on motivation because nothing



Fig. 3.8 The management needs a clear understanding of what it manages (© stock.adobe.com; artist(s): freshidea)

is more motivating for employees than managers and executives that can help them or at least show them the way of how to solve their problems. Control models are hence a vital part of the *eigen*-variety of management.

The necessity to provide insight is a consequence of the so-called **Conant–Ashby theorem** (Conant and Ashby 1970). This theorem stipulates that every good regulator must be a (control) model of the system being regulated (Schwaninger 2006: 19ff). An organization might possess the best competencies and resources, but if the organization and its management do not know how to connect and regulate them, the organization cannot develop its full potential. It is like a car that is disassembled into its parts (Fig. 3.9). Without the right plan or model in the systemic language, one cannot put it together. Similarly, without proper control models, the management cannot connect resources and competencies.



Fig. 3.9 How does one reassemble a car without a plan? (© stock.adobe.com; artist(s): Vlad Kochelaevskiy)

Let us add here another aspect that is particularly relevant to organizational change processes. If the behavior of an organization is strongly influenced by its control models and models of cause-and-effect relationships, then changes in an organization need to address first the mental models that govern the organization and its members. If one does not change the mental models in an organization, the organization can and will barely change. This is one of the practical consequences of the Conant–Ashby theorem and follows the advice practitioners often give: one must change mindsets before changing the organization.

3. Capacity and intention to adjust the variety of the operations

Overview and insight alone do not suffice. Actions, not words count. Hence, the management must be empowered, capable, and willing to adjust the operation's *eigen*-variety in reality and not just in promises. It must deliver, what is needed to adjust the operational variety such as replacing old machinery, adjusting the staff, reducing costs or securing funds. Otherwise, it loses its credibility, such as managers who exactly know what the problems are, but do not have the power or will to make the necessary adjustments. The management must walk the talk, and not just talk the walk.

3.4.2 Who Is the “Management”?

A very important, but delicate question is: who is the “management”? Here, the VSM takes a purely systemic perspective: someone becomes a manager only by executing the tasks mentioned above. **Management is, hence, not a matter of titles and positions, but rather a matter of one's concrete systemic contribution to the organization and its overall equilibrium.** Therefore, the management of an organization is formed by the person or group of persons who actually manages— whoever this might be in the concrete case and situation. The management thus might not always be those who bear the titles of “manager”, “executive” or “president”.

Find this a little irritating? To illustrate this point further, we will again turn to our previous example from Chapter 2: in a soccer team, the management function is mainly executed by the trainer, but not always. In some instances, the management function also includes doctors or various specialists. If a player has health issues, e.g., broken bones, the doctor will decide, whether and when the player can resume his game, not the trainer. The reason is simple: the trainer is not in the position to decide this question or to put it into Ashby's terminology: the trainer does not have the requisite *eigen*-variety. In such a situation, the trainer must leave the decision to the physician.

This systemic view has far-reaching consequences since it implies that the **composition of the management function can change** and that different people in different social configurations can exercise it depending on the issues that need to be addressed. The management of an organization can be represented by appointed individuals, but

also by a group. In organizations, the managing director decides some of the cases, while the whole management board deals with other, and again in other cases, some experts in the company will need to decide, and the formally appointed managers and executives can only follow the experts' "advice". Here we see the implications of the VSM's systemic approach: one is not a manager, because of a title conferred; rather, one becomes a manager and management if one manages. "Management" can then be better viewed as an organizational process, by which the organization regulates and adjusts its (operational) *eigen*-variety to the variety that needs to be processed.

The decision as to who should exercise the management function then becomes primarily a question of who can process variety the best way. Depending on the issue at hand, decisions might then be made by different individuals. The viability of an organization depends on how well an organization enables and empowers these individuals who have the requisite *eigen*-variety, e.g., competencies, to make a decision. Does the organization allow the "doctors" to make the decision instead of the "trainers" or must it always be the trainer, i.e., the appointed manager? Those who wish to develop agility and better decisions must make the management function more flexible and also let those decide who are closer to the issue at hand. This also is one of the core concerns behind recent management approaches that aim to introduce more agility into organizations.

3.4.3 Flexibility Versus Accountability— Why We Need Appointed Managers

From this would follow that organizations should keep the composition and staffing of the management function as flexible and adaptive to actual issues as possible. However, there is a catch to having too much flexibility: if everyone can decide, an organization quickly loses **overview and becomes opaque to itself**. It does not know anymore, what has been decided and by whom. The question "Who has decided this?" risks remaining unanswered. Consequently, organizations must nominate a group of individuals who legitimize decisions on behalf of the organization and who ensure that the various decisions within the organization and a system function are coordinated and known to each other. This is one of the systemic functions of the formally appointed managers.

Organizational charts are often criticized for their reductionism. However, they also offer significant advantages, because they quickly create an overview of the essential decision-making nodes and offer first hints on where one might find the individuals accountable for certain decisions. This snapshot on responsibilities, unfortunately, becomes sometimes misused, if the responsibility for certain decisions becomes too narrowed down to specific individuals (the famous "blame chart") and if one forgets that a decision is always the result of many more people or perhaps even the result of other people as the nominated office holder.

A formalistic view of the organizational chart also promotes the view that only the office holder can and should decide. This creates bottlenecks in the decision-making processes—in terms of time, but also regarding the involved competencies. Organizations must be very attentive to this danger. Consequently, it

is essential to an organization’s viability to remind all office holders that they are responsible for equipping the systemic management function with the requisite *eigen-variety*. This means practically: appointed managers must always ensure that the right people are included in a decision-making process and that their advice is heard and reflected in the decision. And conversely, organizations must ensure that experts make their decisions known to the official office holders so to establish responsibility, accountability, and transparency within the organization.

3.5 The Regulatory Center

Management as the control center of system 1 is confronted with two issues: first, it must break down its decision into operationally useful pieces. It is not enough to know, what needs to be changed and what the new objectives should be; **one also needs to describe the way of how to reach the objectives concretely**. The objective must hence be broken down into steps, measures, and temporal sequences so that the operation can achieve it.

Second, the **management function must be relieved as much as possible from the operational implementation**. If it is too involved, it will not have the sufficient time left to accomplish its main management tasks (see above).

To operationalize targets and relieve the management, organizations must develop so-called “regulatory devices”. These devices are, for instance, plans (e.g., implementation, investment or budget plans), procedures, instructions or rules that translate targets into the required steps and measures and coordinate these activities with regard to their factual, social, and temporal dimension. Every plan (Fig. 3.10) describes what

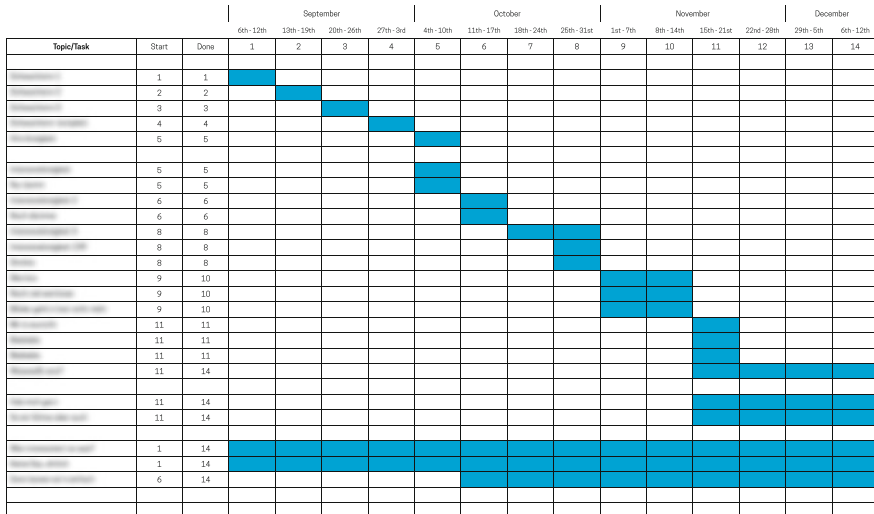


Fig. 3.10 A project plan breaks down the objective into concrete work packages (© stock.adobe.com; artist(s): Robert Kneschke)

needs to be done allowing the operation to become active in a mostly self-organizing way. This is what makes plans so valuable: not only do they allow verifying the feasibility of targets, but they also free up time for management. Good planning enables employees to act and decide for themselves. One then has more time for other tasks left. “Planning” saves management time and increases its *eigen*-variety.

According to the VSM, even the actual operational planning itself should not be anymore the task and responsibility of the management. Planning is different from the proper management function, and therefore the VSM bundles them into the **regulatory center**. The regulation should be best taken over by other specialized units or individuals close to the management, for instance, controlling and planning units. Their responsibility is not to make decisions as the management does, but to develop the plans for the implementation of its decisions and thereby to free up the management.

The quality of the regulatory center is a crucial factor in terms of how much an organization can become self-organizing. Many executives and managers wish to have self-organizing organizations but often make their regulatory center ineffective, for instance, by not involving or even ignoring it through ad hoc decisions. **The regulatory center is one of the backbones of a self-organizing organization.** The better the planning capacities are, the less the management function needs to manage and control the operation directly. Plans are, somewhat paradoxically, the foundation for self-organization and autonomy.

3.6 Interconnections to Other Systems 1

In many VSM diagrams, one finds an unusual symbol: the so-called squiggly lines between the operations of different systems 1 (see Fig. 3.11). These lines, which have been straightened out in our VSM layout, represent the **operational**

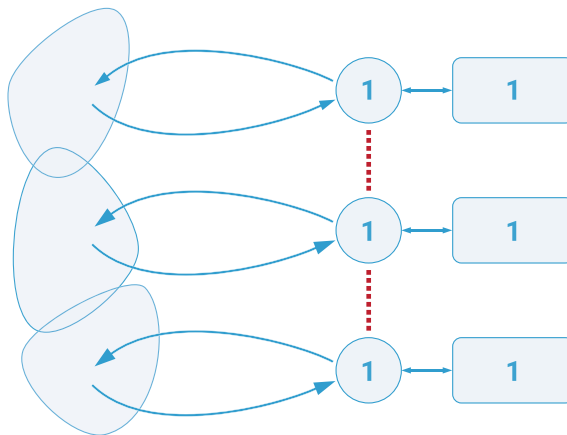


Fig. 3.11 Operational connections and interfaces between the systems 1 (red dotted lines)

connections and interfaces between different systems 1. Examples of these interconnections are, for instance, interdependencies in vertically integrated companies, where the products of one system 1 (engines) are used by another one (cars).

These connections and interfaces can emerge in many other ways and are often unintendedly created. Executives and managers are often surprised by how much employees in their units know about other units—sometimes more than they get to know during top executive meetings. Through many operational interfaces, employees exchange information on many other issues and coordinate, e.g., on policies with regard to salaries. As such, a strike can quickly jump over from one unit to another, simply because the employees know each other from work and have built up solidarity and sympathy for each other. Where the organizational chart shows nothing between units, the VSM makes clear that there are many connections at the operational level that need to be considered, when one analyzes or designs a new organization.

3.7 System 1 as an Ecosystem

So far, we have distinguished between the environment and the organization. This separation is not flawed but instead required for analytical purposes. However, it should not tempt us to forget that environment and organization should be considered as a unity and that both are interrelated to each other.

If the production of the purpose, respectively, the product, is the center of any organization, then this implies that the **basis for the organization** is and cannot be the organization alone, but always **the unity between environment and organization**. Does this sound abstract? Let us clarify this point: a product can only become a product if it is recognized, accepted and paid for by a customer (Drucker 1993: 61). A product without a customer is only an object or abstract promise in the case of a service. Only a customer turns the production output into a product, if he or she wants it and sees value in it. No organization can constitute the purposiveness of its actions on its own. What purpose an organization creates and has, always determines the customer too.

Organizations hence live in a system of mutual relationship and symbiosis with their environment. Environment and organization need to form, in modern parlance, **an ecosystem**, which they must develop and maintain (Fig. 3.12). The better both sides have adjusted to each other and attained requisite variety (“one understands each other”), the more durable this ecosystem will become.

Reinhold Würth, the founder of the globally acting company carrying his name, expressed this mutual relationship pointedly: “We are the employees of our customers” (Würth-Gruppe 2019). New management approaches point into the same direction, whereby communities and niches with customers and users should be cultivated as much as possible to create a strategically sustainable position.

Fig. 3.12 The systems 1 should form ecosystems with their environment (© Fotolia/stock.adobe.com; artist(s): anko_ter)



These ecosystems are the main building blocks of organizations.⁸ It should be the top priority of any (re-) organization project to create the necessary conditions and processes for such ecosystems to emerge as much as possible. “How can we best promote these ecosystems?” This must be one of the guiding questions for the design of organizational structures because the remaining organization only serves this purpose: to enable and promote these ecosystems. This is one of the core messages of the VSM.

Summary

- The basis of every organization is the interaction and exchange with the environment for which it wants to create a purpose.
- The VSM puts the creation of the organization’s purpose at the center of the organization. All related processes form the basis on which the organization rests; they are the system number one of the organization.
- The systems 1 must operate with their environment closely so that they can develop sustainable and mutually adaptive ecosystems. The formation of ecosystems needs to be the guiding principle of every organizational design.
- On its interfaces to the environment, every system 1 must create the necessary meeting points and platforms, sensors, information channels,

⁸ On the dangers for the organization regarding ecosystems: see volume 2.

and translation mechanisms. They must continuously be verified and adapted so as to provide the requisite *eigen*-variety.

- System 1 consists of the operation (production), management, and the regulatory center.
- The responsibility of management consists in providing an overview, insight (control models), and support to the operational processes in regulating their *eigen*-variety.
- Management is primarily viewed from a systemic perspective, i.e., a manager is whoever accomplishes the management tasks and has the requisite variety. Whoever executes a management function must, however, align his or her decisions with the institutionally nominated office holders so that the organization does not lose transparency and accountability.
- The regulatory center regulates the operational activities and plans. It defines the operational measures and activities required to achieve the targets and intentions set by management. In doing so, it frees up management and enables the organization to become self-organizing.

Questions for Reflection:

1. How much is the environment in the focus of your organization? How much does the organizational structure promote the development of ecosystems?
2. How much does your organization pay attention to whoever exercises a management function has the required overview and insight in the area to be managed? How does the organization support the individuals or groups entrusted with the management function?
3. What means are available to the people and groups exercising a management function at the various levels of your organization to increase their *eigen*-variety? How well do these instruments and resources function?
4. How well does the composition of the management function in your organization adapt to different situations and challenges?
5. How well does your organization ensure that individuals or groups entrusted with the management function view themselves as a service to the organization?
6. How well does the regulatory center for your area of responsibility or for the entire organization work? Are you freed up by the centers or do they rather burden you?

References

- Beer, S. (1984). The viable system model: Its provenance, development, methodology and pathology. *Journal of the Operational Research Society*, 35(1), 7–25.
- Beer, S. (1995a). *Diagnosing the system for organizations*. Chichester [West Sussex], New York: Wiley. (Figures 7, 35, 36 and 37 republished with permission of John Wiley and Sons Inc. and the permission conveyed through the Copyright Clearance Center, Inc.).
- Beer, S. (1995b). *The heart of enterprise*. Chichester [England], New York: Wiley. (Figures 21 and 51 republished with permission of John Wiley and Sons Inc. and the permission conveyed through the Copyright Clearance Center, Inc.).
- Beer, S. (1995c). *Brain of the firm* (2nd ed.). Chichester, England, New York: Wiley.
- Conant, R. C., & Ashby, W. R. (1970). Every good regulator of a system must be a model of that system. *International Journal of Systems Science*, 1(2), 89–97.
- Drucker, P. F. (1993). *Management: Tasks, responsibilities, practices* (1st ed.). New York: HarperBusiness.
- Harvard Business Review France*. (2017). September 14.
- Luhmann, N. (1987). *Soziale Systeme: Grundriss einer allgemeinen Theorie* (1st ed.). Frankfurt am Main: Suhrkamp.
- Malik, F. (2008). *Strategie des Managements komplexer Systeme: Ein Beitrag zur Management-Kybernetik evolutionärer Systeme* (10th ed.). Bern, Stuttgart, Wien: Haupt.
- Pérez Ríos, J. (2012). *Design and diagnosis for sustainable organizations: The viable system method*. Heidelberg: Springer.
- Schwaninger, M. (2006). *Intelligent organizations: Powerful models for systemic management; with 6 tables*. Heidelberg: Springer.
- Würth-Gruppe, (2019). *Wie geschaffen für dieses Land*. Retrieved from https://www.wuerth.com/web/de/wuerthcom/unternehmen/fhrungsgremien/stiftungsaufsichtsrat/reinholdwrth/innovationen/innovationen_1.php.

“Joining and Coordinating Forces”— The Operational Metasystem (Part 1)

4

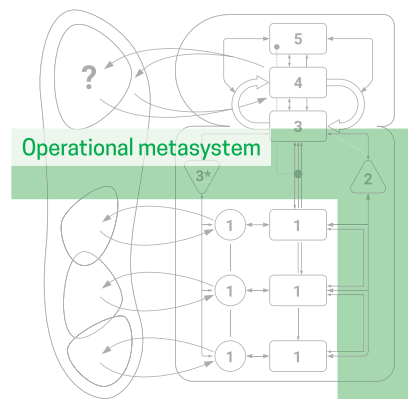
The only thing that will redeem mankind is cooperation.
(Bertrand Russell, Philosopher).

An organization becomes formally constituted, if one does not only perform one task but several and if one does not act alone, but together with others. Put into the VSM language: organizations emerge if and when **multiple systems 1 are joined together**.

Working together, however, leads to additional internal complexity that needs to be managed. This task belongs to the “metasystem”, as Stafford Beer called it, and which consists of the system functions 2–5. However, what is a “metasystem” and why did Stafford Beer use this somewhat awkward term? Moreover, why do we need to split it into further system functions?

In this chapter,¹ we will shed light on these questions. We will first discuss the function of the “metasystem” and then continue with one system function of the operational metasystem (see Fig. 4.1), system 2. The other system functions and parts of the metasystem will follow in the subsequent chapters.

Fig. 4.1 The operational metasystem—contains adaptation from Beer (1995a: 136, Fig. 37)



¹ All figures in this chapter related to the VSM are or contain, if not stated otherwise adapted detail views from Beer (1995a: 136, Fig. 37). For the corresponding permission details, see the reference section at the end of this chapter.

4.1 What is a “Metasystem” and Why is It Needed?

Everyone has undoubtedly made the experience that coexistence does not automatically lead to cooperation. This is true for teams, but also at a larger scale for organizations, for instance, in the context of corporate mergers. Bringing units together causes problems and challenges that one would not have if one continued to work independently—as well as opportunities and benefits that one could not enjoy by not joining others. Put into the more formal language of the VSM and Ashby’s Law: the unification and cooperation of several units **generate additional variety** that needs to be processed.

For this, an organization needs to create a **higher-order perspective** (Beer 1995b: 116; Malik 2008: 91f) **beyond the parochial view of its systems 1** (hence: *meta*). Only, if an overview of the whole organization is established, one can identify the patterns and causal relationships that can become the source of synergies and mutual benefits. This is the contribution of the metasystem to the organization.

Stafford Beer introduced the term “metasystem” very conscientiously, to contrast it with our notion of hierarchies, which could spring to our mind very easily. For him, it was important to shed light on the systemic significance and functions of “levels” in organizations. Higher levels normally imply elevation and subordination thereby expressing aspects of power distribution within an organization. While power is important in organizations (also to get things accomplished), Beer wanted to counterbalance the power perspective by pointing to the systemic function of organizational “levels”. Higher levels exist in Beer’s view first and foremost to strengthen the organization and support the systems 1, e.g., by coordinating them, so that they do not step on each other’s toes, or by creating synergies that allow the systems 1 to gain access to resources more cheaply. **The value and purpose of the metasystem are thus to increase the organization’s viability.**

However, to create an overview, as the term “higher-order perspective” might suggest, is not sufficient for the existence of a metasystem. The metasystem must also deepen the cognitive and self-reflective dimension of the organization. “Metasystemic” hence means also creating a **better understanding** of the purpose and nature of the organization’s core activities. No metasystem survives just by collecting data and information. The metasystem also needs to develop a better understanding of how the various parts of the organization fit together. This is the basis for its existence. The metasystem needs to develop **a new perspective on how the systems 1 can generate benefits together.**²

We can observe this very nicely in the case of mergers and acquisitions when the question emerges: “Now that we have bought all these companies and brought them together, what are we going to do with them?” Investors and executives of the newly formed company must find an answer to this critical question, i.e., a “story”.

² Stafford Beer visualized this different angle in that the system 1 elements are ordered on the horizontal axis, whereas the metasystem builds itself up along the vertical axis.

For this, the executives have to find a new perspective and logic (Beer 1995b: 68f) that could not have been implemented by the individual companies alone.

If the metasystem cannot provide this new perspective and generate a surplus from the cooperation, it loses its systemic value. The cooperation and the metasystem will become questioned, and the conglomerate of systems 1 will eventually break up. Hence, the central challenge to the legitimacy of the metasystem always consists in generating benefits that can result only from more intense cooperation and that outweigh the adverse effects of tighter integration. To repeat the point made earlier: **the primary purpose of the metasystem is to increase the organization’s *eigen-variety*** (see Malik 2008: 92), no metasystem should overlook this.

How can now one understand this relationship between the metasystem and the systems 1 better? What are the precise tasks and responsibilities of the metasystem and how can it generate the additional benefit and *eigen-variety* from an organizational perspective? These are the guiding questions from now on until Chapter 9.

4.2 Anti-oscillation and Coordination of the Operational Units (System 2)

If two or more bodies are moving against each other, this results in frictions with the risk of mutual damages. In organizations, the same problem can arise, if different units, processes, and employees are joined. This can cause dangerous conflicts, or to put it more neutrally, “oscillations” that threaten the cooperation and cohesion of the organization. What organizations need are, therefore, instruments and processes that reduce these possible oscillations. A specific system function is required to accomplish this task: system 2.

4.2.1 “Keep Cool”—The Function of System 2

System 2 probably belongs to the **most extensively used system functions** in an organization. Strangely enough, we seldom notice it: we do not find it in any organizational chart and only rarely in any process description. However, without system 2, the whole organization could not run and function smoothly, consistently, and reliably. The organization would be nothing else than a busy and noisy marketplace full of constant quarrels and disputes, where nothing gets achieved. To use an image from electronics: **system 2 exists to attenuate all the oscillations arising between the systems 1** through rules and regulations.

If we take an example from everyday life: without the right/left-hand traffic rule, life on the streets and roads would be chaotic. Everyone would drive as one pleases, and accidents, honking, and ranting would always accompany street life. To avoid chaos, a rule was adopted defining on which side of the road one should drive. The right/left-hand traffic rule has in the meantime become so ingrained into our everyday life that we do not notice it even further; and yet it is an essential part of

the way traffic is organized. It saves us from continually negotiating, on which side one can pass another car.

Rules hence have a very positive effect: they relieve us from the uncertainty about how others will react and from the necessity to renegotiate regularly actions and behaviors. Furthermore, they enable us to drive our car ourselves without any external watchdog. **Rules limit our behavior, and here is the paradox, they also increase our autonomy.** With rules, we can achieve more than without them. Rules are an ingenious invention of social systems such as organizations or societies, to increase order and autonomy: order instead of conflicts, autonomy instead of external control.

Since the objective of system 2 is to increase the autonomous control of systems 1 and their interaction, **it must not become an end in itself.** System 2 regulations must be designed in such a way that autonomous control becomes easy and second nature to everyone. One should not need to think conscientiously and permanently about what the rules are; they should be rather designed in such a way that one **follows them naturally.**

Therein lies as one of the most significant challenges in the design of system 2: namely to design rules and coordination mechanisms in such a way that they come naturally and are the most efficient way to coordinate, and promote self-control. If an organization fails in designing formal rules that meet these criteria, people in the organization will automatically develop other informal rules that are better suited and will ignore the formal ones.

4.2.2 The Elements of System 2

System 2 consists of the following elements (Fig. 4.2):

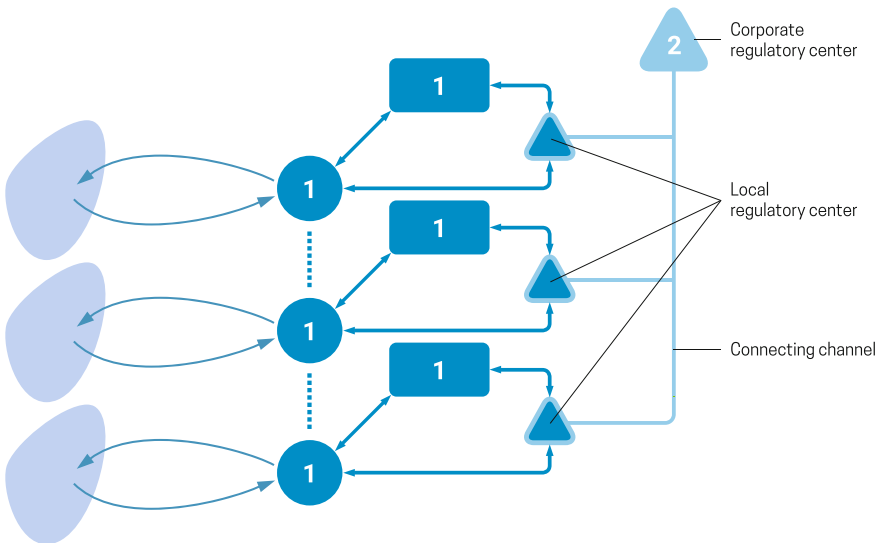


Fig. 4.2 The elements of system 2

1. The **regulatory centers**.
2. The **connecting channels** between the various regulatory centers.

The term “**regulatory center**” does not imply a physical center, but the totality of all coordinating rules and activities in an organization. We differentiate between two types: the “corporate regulatory center” for the entire organization and the “local regulatory centers” for the systems 1 that we have already discussed in the previous chapter. This distinction reflects the simple fact that some issues are important for the entire organization and cannot be left to the local level (for more information, see below).

The **connecting channels** are the second element of system 2, and they remind us that the systems 1 and their regulatory centers need to be integrated into a permanent communication network with all other regulatory centers in the entire organization. These channels ensure that every element knows about each other, stays informed and remains coordinated.

Thus, these channels also stand for the institutional spaces, processes, and infrastructures that are needed to define new and adapt the existing rules and coordination mechanisms. Many rules are not yet defined and will only become necessary at a later point; or, existing rules need to be adapted later given new circumstances. For this, organizations need distinct **institutional spaces and processes**.

Do you want to know more about the regulatory centers? and the connecting channels?

If so, then continue here or otherwise go to Section 4.2.3.

1. Why distinguish between local and corporate regulatory centers?

As said above, the distinction between local and corporate regulatory center is no coincidence; it constitutes and points us to an important aspect about how organizations function and how they should be designed. The reason for this distinction is the fact that in viable systems, not all coordination and regulation should be executed just from one, and in most cases, from the top level. The tasks should be regulated and coordinated from the levels, where the issues to be regulated arise.

Local regulatory centers are closer to the systems 1 and can react faster and more efficiently to the needs of their system 1 than the corporate center. One just needs to imagine the case of a system 1 management that must pass through the corporate regulatory center for any regulatory matter that could have been treated faster and more efficiently by its local center. The differentiation into local and corporate regulatory centers thus increases the efficiency and agility and allows settling issues closer to their origin.

However, the existence of corporate and local centers can also become a source of problems. The viability of the organization demands that all regulatory centers work together and are aligned with one another. As we know, this is not always the case, often merely for reasons of distances, information asymmetries, and time lags. As a result, one finds very often different standards, rules and planning instruments across, especially large organizations.

The channels connecting the local and the corporate regulatory center are hence vital to coordinate all regulatory centers. The organization must take care that the connections between them are well established and continuously maintained. Otherwise, oscillations will arise, and the organization's viability will become jeopardized.

One of the central questions for the design of organizations is then how to divide best up the coordination tasks and responsibilities between the local and corporate regulatory centers. What should the corporate regulatory center coordinate and what should be better left to the individual units, especially if they are closer to the actual challenges? We will deal with this question and the related principle of subsidiarity in greater detail in volume 2 and 3.

2. The “Connecting channels”—The institutional spaces for coordination and regulation

We mentioned above that the systems 1 not only need rules for their mutual coordination but also institutionalized spaces, processes, and rooms, where they can meet, adjust to each other, and develop new rules. These spaces are vital for the adaptation ability of an organization since system 2 faces two fundamental problems: first, the current set of rules solves only current disputes and conflicts, but probably not future ones. Second, each rule creates its exceptions and possibilities of breaching it, of which one is seldom aware when the rule is defined.

To avoid regulatory voids, misinterpretations or mistakes, organizations need spaces that allow a continuous adaptation of system 2. Only, if one has these fora, where rules that are meant to “be carved in stone” can be revisited, discussed, amended or substituted by new rules, system 2 remains adaptive and agile. Even the biblical Ten Commandments need continuous reinterpretation and adaption to new contexts by the religions and confessions that rely on them. Consequently, every religion based on the Bible has instituted fora to discuss the interpretation of the biblical commandments and rules.

We can observe the same mechanism in international politics: one of the key functions of the United Nations is to provide a system 2 for its member states, where the rules of international politics can be discussed and adapted. Theoretically, one could have defined the rules of how states should interact with each other once and forever. However, continuously new evolving situations require new rules or interpretations of old ones.

For this reason, the UN provides institutional discussion fora such as the general assembly or various committees, to settle, regulate, and de-escalate new conflicts.³

These spaces are vital because they distinguish a purely mechanical from an organic-adaptive and self-organizing organization. System 2 is not like a software code; it is a continuously evolving and adapting coordination system that results from intense debates among the systems 1 as well as between the systems 1 and the metasystem. A functioning system 2, thus always encompasses both aspects: the rules, but also the institutionalized spaces for the continuous adaptation of these rules and the development of new ones.

4.2.3 Manifestations of System 2

If system 2 is rarely noticed, how then can one recognize it? System 2 can appear in many manifestations: formally fixed in writing, but also informally and only transmitted orally and “documented” indirectly in behaviors.

In **human society**, laws, rules, and regulations belong to the formal manifestations of system 2. In the informal dimension, we find the standardized use of language, symbols, nonverbal gestures, norms, mores, values, and certain symbols of emotions (e.g., respect, friendship, and love) as the primary system 2 instruments. They all regulate and attenuate oscillations among the members of society.

In **organizations**, we find system 2, for instance, in:

- Every form of **rules, procedures, standardized instructions**, or norms of conduct. They all regulate behaviors and expectations regarding the behavior of others.
- **Every form of operational plan**, since plans regulate who must do what and has access to which resources. A production plan is an instrument that defines the access of systems 1 to production infrastructures, machines and resources thereby preventing the double booking of machines or idle times.
- **Coordination processes** of all sorts, e.g., when secretaries coordinate meetings.
- **Standards**, such as normed data entry fields in forms, accounting standards, budgeting plans, safety standards, product standards, salary systems, or training programs. Apart from their specific content, they all have the purpose to create a mutual understanding and to eliminate sources of misunderstanding and conflicts.
- **Normed symbols and communication conventions** regarding the communication such as signs, gestures, symbols, colors, or company logos.

³ De-escalation could also be a good way to describe system 2.

It is no coincidence that organizations have discovered corporate identity and its symbolic expressions as an essential anti-oscillatory mechanism. Corporate identity does not only define the identity, but also regulates and attenuates the behavior of people. With a mutual understanding of core principles mediated through symbols, fewer conflicts arise in an organization. A shared corporate identity reduces oscillations and increases the efficiency of an organization.

- **The collective knowledge and shared experiences** in dealing with each other:

Experiences with each other make it possible to develop mutually aligned patterns of behaviors that allow predicting the future behaviors of others. If one knows based on past experiences, whether someone else will be irritated by a specific behavior, one can adapt one’s behavior beforehand to avoid conflicts.

This collective knowledge of the behaviors of others as well as response patterns belongs perhaps to the largest, but most difficult areas of system 2 to assess and manage. One can only adumbrate its size, if it is no longer available or lost, for instance, if two organizations get merged that do not yet know each other or if an organization has a high staff turnover. In these cases, the collective knowledge gets dramatically reduced, and errors and misunderstandings start taking place. In these situations, one learns to understand, how much collective knowledge and experiences influence the reliability and efficiency of an organization.

This collective knowledge is also the basis for **trust**. Trust can only be built up based on the knowledge and experiences of past behavioral patterns that allow predicting future behavior. If one knows, what to expect from others, then one knows how much, when and on what issues one can trust each other. This explains, why trust and confidence in each other must be earned: one needs to build up experience and collective knowledge before one can trust each other. Otherwise, everything else would be blind trust.

Trust thus allows controlling possible oscillations and reducing the complexity within an organization (Luhmann 2000). For this reason, organizations actively promote **confidence-building measures**, which help people or organizational units to develop shared experiences and thus trust (“one gets better to know each other”). Based on these experiences, the behaviors of participants become better mutually aligned and can be earlier anticipated and more in-depth understood.

- **Social spaces** such as canteens or informal meeting rooms that allow casual meetings between staff members. These meetings allow the generation of experiences with each other and collective knowledge on the behavior of others and the organization.

If we look at all these manifestations, we get a first impression of how large system 2 is and how much it regulates within an organization. System 2—barely represented in official organizational charts, is a vital instrument for the viability and functioning of an organization.

Informal coordination is good, because fast and efficient, one might think. But this is not always the case, as you can discover in the next section. If you want to know more about this, then continue reading, otherwise, go to Section 4.2.5

4.2.4 Informal Coordinating Mechanisms: A Blessing or Rather a Curse?

The system 2 manifestations that we mentioned in the previous section lead us to another important aspect: modern management literature has highlighted the importance of informal coordination structures in addition to the formal, hierarchical organization. And indeed, since such **informal coordination channels** are less formally structured they offer more flexibility and connectivity while requiring significantly less energy input such as resources, effort, and time. Informal coordination facilitates coordination and thus agility in organizations significantly.

The problem, however, arises in the **selectivity of the informal organization**, because it does not necessarily ensure that everyone affected is involved (Fig. 4.3). A classic example is the smokers' corner: this space allows smokers to update and coordinate informally and faster. The corner, however, leaves nonsmokers out of the information loop. Smokers are typically better informed and coordinated than nonsmokers. This selectivity can be observed in many other informal coordination processes in organizations, such as the importance of corridor talks and the "gents' loo", in particular for one's career (Titz 2011). Informal systems 2 can lead to coordination results that might not take everyone into account and could hence be one-sided.



Fig. 4.3 Informal coordination is fast, but also selective and secretive (© stock.adobe.com; artist(s): WavebreakMediaMicro)

At this point, organizations must be vigilant, because they can then easily be manipulated by these informal and hardly noticeable coordination mechanisms. In an organization, then, the sentiment grows that the organization becomes externally controlled and its decision-making processes nontransparent.

Here, formal coordination processes offer the advantage that the organization and everyone within it can follow and retrace a decision. Symptoms of too much informal organization can be measured by the amount of surprise that decisions generate in the organization. If too many people are repeatedly surprised, then the chances are high that the organization has too many informal networks.

4.2.5 “Master and Servant at the Same Time”— The Double Role of System 2

“A new standard ... not again!”—every coordinator has already heard this cry from the units affected by a new standard. “And what is our benefit from adhering to this new standard?”, is almost always the next question.

We have now come to a very important albeit rarely understood aspect of system 2 that poses quite a challenge: its **double role**. As already Stafford Beer somewhat cryptically stated: “Thus we have to regard System Two, which is a service to system One, as a subsystem of the metasystem.” (Beer 1995b: 201).

System 2 is part of the metasystem and hence operates on a logically higher level, because coordination requires a view of the entire organization. At the same time, it also is a service to the systems 1 allowing them to better coordinate with each other. **As a service, it is subordinated to the systems 1, and as part of the metasystem it is superior to them.** Between these two poles, system 2 must navigate and strike a difficult balance, as most coordinators have experienced themselves.

Do you want to know, why the double role is so difficult and what system 2 can do about it?

If so, then continue reading, otherwise, go to the end of Section 4.2.6

Conflicts among systems 1 are first and foremost only a matter among them. System 2 only emerges as a natural need for coordination among systems 1. In this sense, it is an instrument belonging to the systems 1, which allows them settling and avoiding conflicts. By experience, one knows that rules and regulations are most readily accepted by different parties if they can view them as their instruments for only then can they see their autonomy and self-control preserved. This observation is very much in line with what we said in the first chapter of this book: autonomy and self-control is the highest manifestation of

viability! This implies that the systems 1 want to define and develop their system 2 as much as possible alone. System 2 should be decreed from above as little as possible (see also Pérez Ríos 2012: 31f). To express graphically the aspect of self-coordination, I added a small line connecting the systems 1 with each other to the original graphical representation of the VSM.

On the other hand, system 2 as part of the operational metasystem must consider the demands and requirements of the entire organization. Sometimes systems 1 do not coordinate optimally from the perspective of the entire organization. The smallest common denominator may suffice for the survival of individual systems 1, but in most cases not for the entire organization. In these cases, system 2 must enforce more coordination to generate the necessary synergies.

How then can system 2 satisfy the demands arising from both roles? The inherent tension is a problem that many coordinators and central units experience. There are many possible strategies, and the support of system 3 is undoubtedly a crucial factor, even if this is not very welcome by the systems 1. The most promising and also most natural strategy tries to develop “common interests and objectives”.

In this strategy, system 2 starts from the fact that all systems 1 are oriented toward the environment and need to cope with the challenges arising from it. New system 2 mechanisms should then be designed and explained and advocated in view of the environmental challenges that the systems 1 face. Who can show that the new coordination mechanism helps the systems 1 achieving equilibrium with their environment, will have a higher chance of convincing them as if this mechanism were decreed “from above”.

To take an example: to demand economies and synergies is always a hard sell internally. However, it is easier to do so, if one can demonstrate that markets will become rougher and that system 1 will see their competitiveness significantly reduced if they do not agree to the new coordination mechanism that helps to save costs. Who can refuse such a mechanism? With this strategy, system 2 avoids the impression that it imposes the mechanism from above and can instead present it as a service to the systems 1.

The system 1’s wish to design and develop their own system 2 and coordination mechanisms also has many advantages, which should be used by the metasystem:

1. Systems 1 commonly know better how to master the technicalities for new coordination mechanisms than higher-order functions do. Every coordinator or central unit knows that without the help of the units that need to be coordinated, it is challenging to develop intelligent and efficient coordination mechanisms.
2. Self-developed rules have a higher chance of being followed. They also need to be less audited than imposed ones. This increases the level of self-control and autonomy in the organization.
3. Last, the participation of the systems 1 frees up time for the metasystemic functions, which they then can dedicate to other tasks.

Of course, the systems 1 will not always be sufficiently willing to accept the needs for more integration in the higher interest of the entire organization. In these cases, the imposition of coordination and synergetic measures remains the only possible option. For these instances, system 2 needs the support of system 3. System 3 must not leave system out in the rain, it must back it up. Otherwise, system 2 will become toothless.

4.2.6 “Why Do We Need so Many Rules?”— About the Origins and Size of System 2

An aspect important for the design of organizations concerns the sources of system 2, its scope, and size. System 2 is an essential pillar for the organization, but too many rules can suffocate the organization. System 2 must be used very parsimoniously, and one always must reflect, where and to what extent new rules are indeed needed.

System 2 is a response to conflicts that need to be regulated, as we mentioned earlier. An extensive system 2 then often points to conflicts that are not solved at their roots. Based on the VSM we can identify four main sources of conflicts (s. Fig. 4.4 and Malik 2008: 79):

1. Overlaps in the **environments**.
2. Interfaces and connections between the **operational processes** of different systems 1.

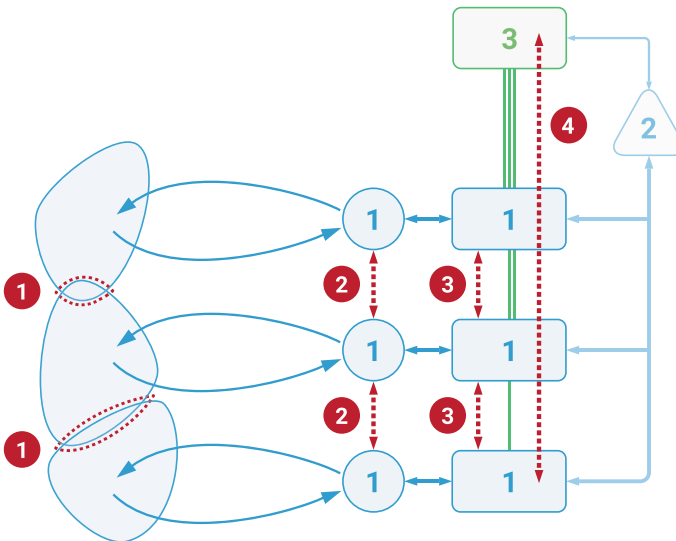


Fig. 4.4 System 2 emerges out of four sources of conflicts

3. Interfaces between the **management processes** of different systems 1.
4. The **heterogeneity of systems 1** and the **level of synergies** demanded by system 3.

As a rule of thumb, the greater the overlaps in the environment, the stronger the interconnections, the more heterogeneous the systems 1 and the more ambitious the synergy targets are, the more intensive system 2 must be.

If one wants to reduce system 2, one must consequently address one of the sources mentioned above. Instead of inventing new coordination mechanisms, one should then better consider first reducing the need for coordination at these four sources. If, for instance, business units face overlapping markets, where several units address customers, one could either create a coordination mechanism or try to sharpen the market boundaries. Refined boundaries have the advantage that no conflicts will arise henceforth and that without a coordination mechanism one need not worry anymore about the enforcement of the mechanism. The best coordination mechanism is the one that reduces the need for coordination!

Do you want to know more about the causes of conflicts? Then continue reading, otherwise go directly to the end of this chapter

1. Overlapping environments

Overlapping environments can be the result of **three causes**:

i. **Wrong segmentation** of the environment

Problems in the segmentation appear, if, for instance, business units address the same market segments, or a customer is served by a local retailer as well as by a global online sales unit. Simultaneous communication channels to a customer from different units require rules as to how the various products and information to the customer are coordinated.

ii. **Penetrable boundaries** between environments

Boundaries between different environments imposed by the organization can become penetrable, for instance, if customers from one market start importing products from other markets (e.g., gray and parallel markets in the pharmaceutical industry or watching movies from Netflix USA outside the USA).

To deal with these penetrations the units concerned will need to coordinate, so as to control the infiltration from one into the other environment.

iii. **Interdependencies** between environments

If customers of a specific product are accustomed to using it together with other products, the company must ensure technological compatibility. Such a situation implies on the inside of the organization that the units working for different products need to coordinate, such as by defining common technical standards and coordinating the development of new product features.

From this, we can observe how the organization segments its environment, sets market boundaries, and controls interdependencies it also affects its internal complexity. The clearer the segmentation of the partial environments is, the less internal coordination will be required, and consequently, the better and more efficiently the organization functions.

This implies for the organizational design process that one should not focus on the organizational structures alone, but also on the interdependencies between the environments that the organization is addressing.

2. **Operational interfaces and interconnections**

Interfaces and interconnections between the operations can arise, for instance, in integrated production processes, where the output of one operation is the input of another one. In these cases, the production processes need to be coordinated among different operations. The task thereby is not only to optimize the interfaces between the operations. One should also investigate how many interfaces are indeed needed and how the production process can be reconfigured in such a way that the number and complexity of these interfaces can be reduced.

“Integration” and “networks” are terms used today with a positive connotation. However, this is only one side of the coin, the negative consequence of more integration are more interfaces with an exponentially growing number of possible combinations. Too much integration and connectivity can ultimately lead to highly interdependent and complex systems potentially getting out of control, which is particularly a problem in IT integration or reorganization projects. If one designs new organizational structures, one must therefore always evaluate the number and complexity of interfaces created by different organizational options.

3. **Managerial interfaces**

Interfaces between the management emerge, for instance, if two relatively similar systems are managed differently. One head of unit adopts a more flexible home office policy whereas the manager in another unit forbids it. If this gets known to the employees of the other unit, then questions will arise, and the two “home office” policies need to be coordinated.

4. The heterogeneity of systems 1 and the targeted level of synergies

More intense coordination can also result from the **differences in the variety** that the systems 1 must process. The more heterogeneous products are produced, the more difficult it is to define a standard product platform and thus the more rules must be created to ensure compatibility. This problem is not limited to products as such; heterogeneity affects many other aspects of organizational life such as the management of resources, internal control mechanisms, reporting guidelines, and KPI systems.

One solution is to reduce the heterogeneity by standardizing the variety across the systems 1. How many different types of screws do we really need for our products? Whether one is successful in standardizing the products and their components thereby depends not only on the organization itself but also **on the environment, i.e., the customer**. Certain aspects of the variety are defined by customer preferences and not by the company alone. So, to standardize the product, one might even be forced to standardize the environments as well. This might mean reorienting and reeducating the customer to other products, preferences, and technological solutions.

The intensity of coordination depends not only on the heterogeneity of the systems 1 but also on how deeply they should become integrated. Here, we touch a vital role **system 3** plays: system 3 itself can also become a cause for more coordination. The target level of synergies defined by system 3 determines the necessary level of coordination and as such the size of system 2. The more synergies system 3 wants to generate and the closer the systems 1 need to work together, the more the need for coordination and standardization increases.

All these thoughts point us to a very important aspect: the amount of coordination is largely driven by the variety that the organization wants to process, the way how this variety and its processing is structured by the organization and, finally, by the desired level of integration. This leads us to one central message of the VSM: organizations and their **structures must reflect the variety that they want to process**. In light of this, the design of organizational (chart) structures thus should not start with the structures. It must start with the question regarding which variety needs to be processed, how the chosen variety should be optimally structured and, of course, which variety should not be processed at all. This is perhaps the most important question at all in a reorganization process.

Summary

- Organizations emerge when several systems 1 are combined and require a distinct higher-order control function that views the systems 1 in their entirety.
- This higher-order function is called the “metasystem”. The metasystem processes the variety that results from the cooperation of several systems 1 and goes beyond the scope of the individual systems 1. The metasystem consists of the system functions 2–5.
- The metasystem’s legitimacy is based on its ability to generate a net value that the systems 1 could not have created on their own.
- The operational metasystem consists of the coordination (system 2), the operational control and synergy function (system 3) and the audit function (system 3*).
- System 2 is one of the most extensive functions in organizations. It ensures that through rules and regulations no conflicts arise within the entire organization and that the systems 1 remain aligned with each other as well as the organization’s purpose and strategy.
- System 2 consists of the regulatory centers and the connecting channels, such as institutionalized spaces that allow the systems 1 to interconnect and coordinate with each other and adapt the existing rules and regulations on an ongoing basis.
- System 2 is part of the metasystem, but at the same time, it is also a service to the systems 1. It thus functions in a double role. Its success depends on how much it succeeds in aligning the objectives and demands emerging from this double role.
- The size of system 2 results from four main factors:
 1. the overlaps between the system 1 environments,
 2. the interfaces between the operational processes of the systems 1,
 3. the interfaces between the managerial processes of the systems 1,
 4. the heterogeneity of the systems 1 and the targeted synergy level of system 3.

Questions for Reflection:

1. How well does the system 2 of your organization and your area of responsibility operate? Do you often experience conflicts and what are the reasons for it? Are the conflicts only related to personal issues or do they also show deficits in the coordinative work of the organization?
2. Which manifestations of system 2 (see list above) are not so well developed or used in your organization?

3. Apart from existing regulations, how well suited are the institutional spaces in your organization for the ongoing adaption and development of rules?
4. Looking at the “coordinators” in your organization: how well are they aware of the double role they must play? How well can they satisfy the demands resulting from both roles (being a service of the systems 1 and ensuring the overall perspective)? How well can they find common interests among the units that need to be coordinated? How well are they supported by higher management levels or are they left unsupported?
5. Could the size of your current system 2 be optimized by improving the problems that emerge from one of the four sources of conflicts (see Section 4.2.6)?

References

- Beer, S. (1995a). *Diagnosing the system for organizations*. Chichester [West Sussex], New York: Wiley. (Figures 7, 35, 36 and 37 republished with permission of John Wiley and Sons Inc. and the permission conveyed through the Copyright Clearance Center, Inc.).
- Beer, S. (1995b). *The heart of enterprise*. Chichester [England], New York: Wiley. (Figures 21 and 51 republished with permission of John Wiley and Sons Inc. and the permission conveyed through the Copyright Clearance Center, Inc.).
- Luhmann, N. (2000). *Vertrauen: Ein Mechanismus der Reduktion sozialer Komplexität* (4th ed.). Stuttgart: Lucius und Lucius.
- Malik, F. (2008). *Strategie des Managements komplexer Systeme: Ein Beitrag zur Management-Kybernetik evolutionärer Systeme* (10th ed.). Bern, Stuttgart, Wien: Haupt.
- Pérez Ríos, J. (2012). *Design and diagnosis for sustainable organizations: The viable system method*. Heidelberg, New York: Springer-Verlag.
- Titz, Ch. (2011). *Karrieren werden beim Pinkeln gemacht*. Der Spiegel. June 6, 2011.

“Controlling and Optimizing”— The Operational Metasystem (Part 2)

5

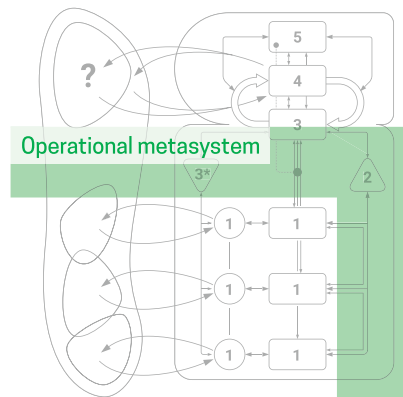
The lowest common denominator of the universe is both low and common.

(R.A. Lafferty, Science Fiction Autor)

Coordination is necessary, but it alone does not suffice. One only needs to meet at the lowest common denominator, to be already coordinated, and one can live at this point quite comfortably: “It was nice together, but we did not hurt each other too much.”

It needs another function that manages the entire organization and tries to achieve the optimum cooperation of the systems 1. A function is required that identifies and defines a target that goes beyond what can be achieved by the individual systems 1 alone. “How could we achieve more if we cooperated more intensely?”—Systems 1 rarely ask themselves this kind of question. To search and enforce the “more” from cooperation is the task and responsibility of system 3, which is thereby supported by system 2 and 3* (Fig. 5.1). About system 2 we talked in the last chapter; in this chapter, system 3 and 3* will be our focus.¹

Fig. 5.1 The operational metasystem (contains adaptation from Beer (1995b: 136, Fig. 37))



¹ All figures in this chapter related to the VSM are or contain if not stated otherwise adapted detail views from Beer (1995b: 136, Fig. 37). For the corresponding permission details, see the reference section at the end of this chapter.

5.1 Controlling the Operational Organization and Generating Synergies (System 3)

5.1.1 The Tasks of System 3

The basis for system 3’s existence is an exchange process, which already Chester Barnard (1968), one of the pioneers of modern management theory, described. The systems 1 give up their independence for an objective that they cannot achieve on their own and that generates more benefits than what the systems 1 could have achieved individually.

System 3’s task is to bring everyone to a common ground, to organize and implement joint and coordinated actions. It defines the level of synergies required, and it allocates resources (e.g., money, time, employees, infrastructure, and knowledge) to the systems 1 in such a way that additional value is generated for the entire organization.

System 3 has three specific tasks, which are represented graphically by **three central channels** in the VSM (see Fig. 5.2):

1. **Negotiating the resource allocation with the systems 1** (“resource bargaining”-channel) such as in budgeting processes.
The focus of this channel is not only the allocation of resources per se but also the generation of as many synergies as possible and necessary for the entire organization. These synergies can then either be **redistributed to the environment** (e.g., lower prices, dividend payments to shareholders), **invested into the organization** (e.g., infrastructure, machines) or kept as a **reserve** to protect the organization against temporary fluctuations (e.g., seasonality of demand, business cycles, or crises). System 3 thus controls the organization’s **resource storages** (e.g., financial liquidity planning, inventories of critical raw materials) that ensure the organization’s stability across time.
2. System 3’s task is also to establish **responsibility and accountability** within the organization (“accountability-channel”) by demanding and tracking it.
3. Finally, system 3 is also responsible for defining the **boundaries between the systems 1**, their relation to the entire organization, and the principles according to which they should operate (“Legal and Corporate Requirements”).

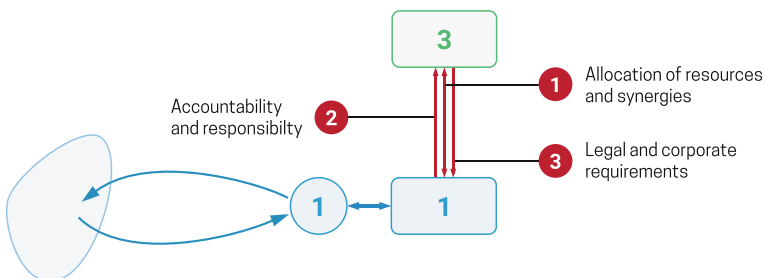


Fig. 5.2 The three channels of system 3 to its systems 1

At this point, we need to add some explanatory comments concerning a graphical detail in the VSM: for reasons of simplicity, the three channels that we just discussed are in most cases not shown, but only represented by one channel.² As mentioned earlier, all channels always connect just one system 1 with system 3 while no vertical channel passes through another system 1.³

**Do you want to know more about the functioning of the three channels?
If so, then continue here, otherwise go to Section 5.1.3.**

5.1.2 The Working of the Three Channels in Detail

1. The resource bargain channel

The term “resource” has an extensive meaning in the VSM, and the *bargain for resources* is not only limited to money but also encompasses resources such as employees, time, space, infrastructure, machinery, and equipment. A production plan, for instance, is the documented result of a bargaining process about production resources and time slots in the production. It defines which production line, machines, and workers become allocated to a business unit, product line, or individual customer order depending on many factors such as synergies, urgency, and strategic relevance. If the priority of a customer order is high, then it will be executed earlier. The question “cannot we do it earlier because otherwise, we lose this customer?” serves to move one’s position upward in the bargaining process.

This bargaining process does not only occur in the typical high-level planning processes, as one might think first but whenever resources need to be shared (e.g., office space, inventory space, and computing power). The allocation of all these resources is always a system 3 process.

2. The accountability channel

How often have we heard the call for more responsibility and accountability, but nothing changes? In these instances, we can observe how much the sense of responsibility and accountability in an organization is not given. It must be developed actively and demanded firmly.

² In some cases, two channels are shown to represent the downward and upward flow of information.

³ This also applies to the inter-recursive channels from systems 4 and 5 to the systems 1.

Responsibility does not come naturally, but must yet be established, and this also is one of the core tasks of system 3.⁴

Often, organizations ask their employees for more responsibility but forget that this is just one side of the equation. Responsibility is not only a matter of the individual employee’s attitudes and character, but it also needs to be supported by the organization and its institutions. If an organization does not demand, monitor, and reward responsibility, one should not be surprised that the individual’s willingness to be responsible declines. Organizationally demanded responsibility, and the individual’s sense of responsibility always come together in pairs!

Responsibility and accountability are very important and efficiently working stabilizers. They restrain the variety of the system 1’s action radius. Responsibility and accountability ensure that resources are used as envisaged and agreed. Whoever is accountable for the use of resources is bound and cannot use them anymore no matter which way. Responsibility is a (social) bond controlling behavior.

Where- and whenever the accountability channel is not used or not well functioning, we consequently see that problems related to the usage of resources emerge leading to scandals that may even threaten the viability of the entire organization. It is thus not accidental that responsibility and accountability are chosen as one of the central vertical channels in the VSM; they are one of the “backbones”, on which an organization’s stability rests.

How then can the accountability channel influence, control, and restrain the freedom and variety available to systems 1? Basically, through three instruments:

1. **Setting and intensification of targets:** setting, increasing, or refocusing targets limits the freedom, within which systems 1 can act. It reduces their possible radius of action, and hence their *eigen*-variety. They cannot act as they want but need to maintain a tighter focus on their activities.
2. **Intensifying the modes of reporting and monitoring:** the more the systems 1 are made to report and monitored, the smaller their freedom and *eigen*-variety become. Stricter observation by superiors with more questions regarding the content and details of their area of responsibility reduces their maneuverability.
3. **Increasing possible sanctions or reducing rewards:** harsher sanctions or fewer rewards immediately influence the willingness to take risks. Such measures automatically reduce the range of options

⁴ Naturally, responsibility is also required in other places within the organization, but its most significant role relates to the use of an organization’s resources.

available to the systems 1. We see this quite well with bonuses: the extension of waiting periods for share options for executives or the broadening of personal liability intends to reduce risky behavior.

At this point, we should mention one crucial but sometimes overlooked aspect: responsibility also requires that the **resources are indeed handed over to the systems 1 by system 3 and are no longer controlled by system 3**. Real responsibility can only emerge if resources are indeed entrusted to the person responsible for them. Responsibility hence demands the autonomy of systems 1. Responsibility and autonomy, paradoxically come always in pairs!

3. The channel of Legal and Corporate Requirements

The third channel from system 3 to the systems 1 concerns the legal and corporate requirements (sometimes called the “corporate intervention” channel). This channel becomes visible in legal or statutory principles and rules such as in the provisions that define the relationship between subsidiaries and a holding company.

These are the decisions that...

- ...define or change the **boundaries of the systems 1** (e.g., redrawing the market boundaries, separation or merger of systems 1)
- ...define the **functioning of the systems 1**, e.g., which technologies, processes, resources, or practices can be used or are forbidden (e.g., for environmental or health reasons)
- ...define the **mode of how systems 1 are integrated** into the whole organization (e.g., the acquisition of other companies)
- ...**close or exclude systems 1** (e.g., the sale of subsidiaries or business units) or
- ...**found, respectively, integrate a new system 1**

The possibility to define the future of the systems 1 is also one of the **bases that give system 3 power over the systems 1**. However, this power basis is not absolute in viable organizations; it always must be exercised in view of the purpose of the organization and how this purpose can be best created and maintained on a long-term basis.

5.1.3 Who Is “System 3”?

Typically, people who get to know to the VSM identify system 3 with their superiors. However, this is not the only manifestation of system 3; it can take on many different social forms. In some cases, the managing director as system 3 decides himself, but at other times, a decision is taken by a group such as a management team

or the managing board, which then becomes the system 3. Organizations need a system 3, but how it is composed and which social form it takes depends on the type of decision that needs to be taken and consequently varies (Beer 1995c: 116).

Thus, it is even conceivable that system 3 might be composed of representatives from the systems 1. The challenge for systems 1 representatives is then to change their role and perspective, when they exercise a system 3 function. They must adopt a global and metasystemic perspective and relinquish their parochial view. If, for instance, the individual product unit managers gather with the managing director to decide on the allocation of innovation budgets, then they should not consider their products alone, but also the needs and objectives of the other product units and the entire company (Beer 1995c: 207).

Letting system 1 representatives participate in system 3 has certain advantages: they learn to understand the global perspective and what is required for the viability of the entire organization. This reduces parochialism and facilitates the acceptance of decisions that can run against the interests of individual systems 1. Also, it helps to reduce the need for translating between system 3 and the systems 1 (see Chapter 11) and thus averts misunderstandings.

However, for this to work, it is essential that the change in the perspectives of systems 1 representatives indeed happens. Systems 1 representative need to be willing to understand the needs and demands of the entire organization. They need to understand them as being system 3. This means that they must wear two hats. If this change of perspectives does not occur, their participation instead renders system 3 dysfunctional and paralyzed.

**Do you want to know why system 3 needs a channel to system 2, because otherwise, it would probably fail to achieve its objectives?
If so, then continue here, otherwise, go to Section 5.2.**

5.1.4 System 2: Vital Support and Ally of System 3

An essential instrument for system 3 is its connection to system 2 (Fig. 5.3) for several reasons:

1. Many system 3 decisions have an **impact on the coordination level and processes**. If system 3 wants to achieve higher synergies, then more coordination is often required. Without the appropriate system 2 instruments, the desired synergies cannot be achieved.

If, for instance, the management of a company defines new budgetary targets (system 3), it also needs adequate planning instruments and reporting standards (system 2). If the necessary control instruments are not in place, it will be difficult for system 3 to monitor the development of its budget and to counteract deviations from the target path.

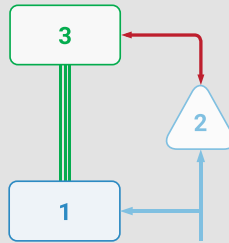


Fig. 5.3 The channel between system 3 and 2

2. **System 3 can influence and stimulate the organization’s level of integration and synergies by using system 2**

System 3 can demand synergies through its central command channel to the systems 1, but it can also increase integration more subtly by using system 2. The more system 2 coordinates system 1 issues, the easier synergies can be gained.

3. Finally, system 3 must be able to influence the **self-coordination activities** among the systems 1

Self-organization has a very positive connotation nowadays, but that hides the danger that the systems 1 might coordinate themselves in a way that can become detrimental to the overall organization and its synergies. System 3 must be aware of this. Consequently, system 3 must have access to these coordination activities, i.e., a channel to system 2 and an ear on how the operational organization coordinates itself.

5.2 Auditing and Improving the Operation (System 3*)

5.2.1 Why Is a System 3* Needed?

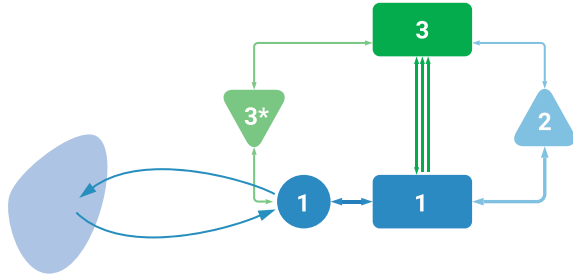
The all-time classic British sitcom “Yes Minister” (Lynn and Jay 1989: 163) once described one of the key dilemmas of system 3 to the point. In the episode “Jobs for the Boys”, the minister Jim Hacker suspects a construction scandal, but he has one fundamental problem...

What is it [...] that I do not know? It’s just that there’s something I don’t know, and I don’t know because I can’t find the right question to ask you because I don’t know what to ask. What is it that I don’t know?

Three aspects make system 3* necessary:

1. System 3 does not know, how reliable its information channels to the systems 1 are: does the management of the systems 1 report everything important to system 3?

Fig. 5.4 System 3* connects system 3 to the operation of system 1



2. System 2 and 3 regulate the systems 1, we said. But not everything can be regulated; there always remains variety that escapes regulation or is even created through the invention of rules and regulations. Every law in this world generates its exceptions and loopholes.
3. The system 1 management might turn blind regarding its *modus operandi* and overlook opportunities to improve. It also might not be aware of the latest technologies and methodologies. System 3 itself might suspect the existence of untapped potentials, but it does not have the time to “look into the details” and unlock these potentials. Its concern can only be to hold the entire organization together.

In this situation, system 3 needs the support of another system function counterbalancing the deficits mentioned above and acting complementarily to system 2 and 3. This function, called system 3* (Fig. 5.4), entails **auditing processes** such as inspections, audits, benchmarking, and mystery shopping, but also initiatives **to improve and optimize the operational performance** of the systems 1, e.g., in the production.

5.2.2 System 3*—A Delicate Task

System 3* is not just another information channel to system 3 as is often understood. System 3* becomes easily regarded as the “spy of corporate management”, but this is a reductionist view; its responsibilities are more far-reaching. System 3* needs to fulfill **four other essential functions**, namely...

1. ...to add a **perspective** to the operational organization that **differs from the existing one within the operational organization**.⁵
2. ...to **counterbalance system 2 and 3 through spontaneity**, so in their temporal structure.

⁵ That system 3* is a separate function has become clear to Stafford Beer relatively late. For instance, in the books *Brain of a Firm* (1995a) and *The Heart of Enterprise* (1995c) system 3* is missing. Even Espejo and Reyes (2011: 103), Fig. 6.3) show the auditing function as a channel and not so much as a distinct system function.

3. ...to create trust and confidentiality to **close the information gap** for system 3.
4. ... to become an **instrument of the systems 1** and not just remain an extension of system 3.

**Do you want to know more about these four functions of system 3*?
Then continue here or go to Section 5.2.3.**

1. System 3*—source of different perspectives

One of the core functions of system 3* is not only to inspect operational processes but also to view them from a **different perspective**. “Four eyes see more than two”—this principle is only valid if the second pair of eyes has a perspective different from the first one. Otherwise, the second pair of eyes just sees the same as the first. Thus, the generation of a different perspective is necessary to detect potentials for improvements or possible instabilities.

This insight brings us to an aspect of system 3* that is rarely understood sufficiently: to develop an effective system 3*, the organization must also **grant system 3* the freedom to create a different perspective of the operational processes**. System 3* must have the room to think out of the box and to confront the operational organization with new and different approaches. Whoever wants a viable organization must allow a culture that values different perspectives, and that encourages system 3* to develop them.

At first, this sounds trivial, but real life in organizations shows how difficult it is to enable such a culture and freedom in an organization. Changes in the *modus operandi* of systems 1 often also have an impact on the way the organization as a whole is coordinated and managed, and this includes system 2 and 3. New production processes or measures against fraud not only require changes in the systems 1, but also in system 2 and 3 such as in the organizations’ reporting systems, standards, and control methods. But, are these changes welcome? Not always, because they mean work, difficult decisions and might even criticize systems 2 and 3’s current setup. This explains why audit reports often disappear in drawers, even if they were officially declared as welcome. Thus, **system 3* works not only in opposition to the systems 1** (how it is often perceived) **but also to system 2 and 3** and, paradoxically, might face resistance from its metasystemic sister functions that initially commissioned it.

2. System 3*—the spontaneous part of the operational metasystem

Another critical aspect of system 3* is that it must counterbalance system 2 and 3 not only in the factual but also in the temporal dimension. System 3* must establish another time structure within the organization: it must **act spontaneously and unpredictably**. Why is this so?

System 2 and 3 try to regulate the organization: plans, timetables, and schedules are attempts to make the organization more predictable. However, like burglars who act once the security guards have finished their routine controls, events might take place in organizations precisely in those moments, when no one has predicted them.

The sporadic nature of system 3* is necessary to capture the unpredictable and spontaneous side of an organization and eradicate the blind spots that are created if an organization relies too much on planning and regulation (Beer 1995b: 85). Viewed from this angle, we realize that system 3* works, in fact, **complementary to system 2**. Thus, unannounced tests are not an instrument to destabilize the organization as they are often perceived, but instead to add to its stability.

3. The challenge: how to know that one knows all?

A different perspective and spontaneity are essential elements, but they cannot solve one fundamental **cognitive problem** of system 3*: how does it know that it has discovered what needs to be discovered? For this, it would need to know that it has unearthed all the problems in the organization. As a minimum lower boundary it must know that it knows at least as much as the systems 1 know about themselves.

Thus, system 3* will seek feedback from the systems 1 that it has investigated every aspect and not turned blind. This explains, why auditors are sometimes picky and try to find problems at whatever cost; they need the feedback from the systems 1 that they have discovered all that is to know. The problem, of course, is that the systems 1 are aware of system 3's need for such feedback and consequently try to acquiesce system 3*. To have the audit finished as soon as possible, the systems 1 tend to flatter system 3* about its rigorousness or, even more sophisticated, let it find selected hidden aspects that are not dangerous to the systems 1.

These counterstrategies of the systems 1, of which every auditor must be conscientious, only reveal the difficulty for an auditor to close the **information deficit**. The challenge for the auditor then is that the unknown and missing information cannot be obtained by intellect or competence only but rather requires having fully experienced the real life on the ground in the systems 1. One needs to have seen what is actually happening in the systems 1. However, this would require in-depth observation over a longer time, which system 3* does not tend to have.

This information gap can only be closed if system 3* succeeds in making **system 1 talk about itself and reveal its problems**. Thus, an essential skill for system 3* is to encourage the systems 1 to open up and allow the auditor to look into all its facets. Only then might the aspects come to light that even the most experienced auditor could not have imagined. Only then does system 3* know that it knows almost everything relevant and has reached the depths of the systems 1. An audit without surprises to the auditor and an act of self-revelation on the part of the systems 1 should be an indicator that the audit has not yet uncovered everything.

This self-revelatory act by the systems 1 does not come by itself. It might sometimes need coercion and interview tactics to break up the coalitions within the systems 1. But more fundamentally, system 3* must be able to generate mutual trust between itself and the system 1 or at least some elements of system 1. To create this **trustful relationship**, system 3* must let itself experience as a service to the systems 1 that helps the systems 1 to increase their viability and to develop along a better and more sustainable way (for more, see below Section 5.2.3).

4. Releasing the full potential of system 3*—not only a top-down but also bottom-up channel

The previous section leads us to another aspect of system 3* that is rarely understood sufficiently⁶: **System 3* should not only be activated by system 3 but can and should also be initiated by the systems 1**. Especially, the operational areas of system 1 often have more knowledge about the problems of their processes and how they can be solved. Thus, activating the systems 1 is often a more effective way to achieve improvements in an organization than if these optimizations were instigated by system 3.

For the employees of system 1 to bring forward their thoughts and ideas is, however, not self-evident and a natural process. It needs the appropriate channels and institutional frameworks, which can range from suggestion boxes, workshops to create ideas and even “whistleblower lines”. These are all devices to help system 3* to emerge upward from the systems 1 and to bring issues to the attention of the metasystem.

As experience shows, setting up and institutionalizing such devices and processes are important; however, for the vitality of this “bottom-up”-channels a **“welcoming culture” fostered by the metasystem** is even more critical. As we said earlier, organizations mostly prefer routine and

⁶ For this insight, I am very grateful to Roger Harden, who made me aware of it during the Metaphorum Conference 2016 in Leeds, UK.

are averse to change, and employees know this. Thus, to raise ideas for improvement always needs courage. Ideas about changes expose people and most likely generate enemies. It is always easier and more comfortable to say nothing than to make “suggestions” that can be misunderstood, criticized, and dismissed with unfriendly comments.

How system 3 “welcomes” proposals for improvement influences the courage of people to voice new ideas for improvement in the future. If ideas for improvement are not welcome or even ignored, employees will stop communicating and sharing their ideas. Thus, a performant and viable system 3* requires that **new ideas and critical comments are encouraged** as much as possible. The metasystem should never just collect the ideas but always convey the message to the systems 1 that these inputs are welcome and used.

5.2.3 The Struggle for Autonomy—The Delicate Relationship Between the Auditors and the Audited

One of the significant challenges for system 3* concerns its paradoxical position which is similar to the one of system 2 (Section 4.2.5) : every inspection lets the systems 1 fear that their autonomy becomes restricted. Consequently, the systems 1 will seal themselves off against this intrusion to protect their freedom. However, the opposite effect can also happen: the systems 1 become so intimidated by system 3* that they leave the management of their entire system 1 to system 3 or 3*. The management of the systems 1 then, unintentionally, turns into a puppet of the operational metasystem.

This situation results into a **logical dilemma** for whoever is exercising a system 3* function: an auditor needs to reveal problems, but, at the same time, he or she needs to assure the systems 1 that they will not be limited in their autonomy. We mentioned earlier that system 3* needs to generate trust but how precisely? Similar to what we have said earlier about system 2, systems 3* needs to show the systems 1 that it supports them and is also on their side.

System 3* can help the systems 1 twofold: first, in their efforts to handle **the variety of their environment**. The improvements suggested by the auditor should in the end, always help the systems 1 to become more responsive and robust toward their mission and challenges in the environment. Second, system 3* can also help the systems 1 in **their relationship with system 3**, which can sometimes be tense. System 3* can offer the systems 1 help to improve and meet the demands of system 3 as well as explain the constraints of the systems 1 to system 3.

This requires one important attitude from system 3*: it must not appear as a competitor for the attention and favor of system 3 or as a substitute for system 3. System 3* works best, if it acts “just” as a **catalyst that starts a self-reflection process within the system 1** and where, in the end, the systems 1 themselves

present the audit results as the result of their own investigations and reflections. So as if, the systems 1 had discovered their mistakes or untouched potentials themselves. This way, the autonomy and reputation of the systems 1 remain protected. System 3* becomes then rather the enabler than the “examiner” of the systems 1. System 3* then helps by providing the methodological framework, instruments, and time to the systems 1 so that they can analyze their problems and better generate ideas for improvement.

This is also in line with what should be the **overall objective of an audit**: an audit should not be an end in itself and used as a power instrument to oppress the systems 1. Instead, it should serve and be presented as an instrument to the systems 1 to improve their *eigen*-variety toward the environment and to better conform to the demands of Ashby’s Law; it should not appear as a punishment. Only with this mutual understanding, system 3* has a chance that the systems 1 will open and that it can know, what it should know.

Summary

- System 3 controls the systems 1 along three channels: the resource allocation, the responsibility and accountability, and, finally, the corporate and legal requirements channel. Through these three channels, system 3 manages the *eigen*-variety available to systems 1.
- System 3 can be exercised in different social compositions: by individuals, groups of individuals, or general assemblies. Decisive for the right choice is that the chosen social form and people have the requisite *eigen*-variety for the variety they need to process through their decisions.
- System 2 is an essential support instrument for system 3 and the implementation of its decisions since it provides the necessary integration, coordination and planning instruments.
- System 3* is necessary for all the aspects that escape the regulation and control of system 2 and 3. It compensates the information deficit of system 2 and 3 regarding the systems 1. To function well, system 3* needs the freedom to develop and contribute a new and different perspective to the organization and act spontaneously.
- To overcome the information gap, system 3* must win the trust of the systems 1 and present itself as a service and catalyst for the systems 1 to improve their *eigen*-variety.

Questions for Reflection:

1. How well are the system 3 tasks in your organization executed?
2. How well are responsibility and accountability alive and practiced in your organization?
3. How well does system 3* in your organization function? How well does system 3* in your organization know that is performing?

4. How well does system 3* secure the support of the systems 1, 2 and 3?
5. How much does your organization care that system 3* also emerges from the systems 1, so bottom-up? How much does system 3 in your organization welcome the ideas and suggestions made by system 3*? How much do you encourage subordinates to contribute to system 3*?
6. How well is system 3* working in your area of responsibility?

References

- Barnard, C. I. (1968). *The functions of the executive*. Cambridge: Harvard University Press.
- Beer, S. (1995a). *Brain of the firm* (2nd ed.). Chichester, England, New York: Wiley.
- Beer, S. (1995b). *Diagnosing the system for organizations*. Chichester [West Sussex], New York: Wiley. (Figures 7, 35, 36 and 37 republished with permission of John Wiley and Sons Inc. and the permission conveyed through the Copyright Clearance Center, Inc.).
- Beer, S. (1995c). *The heart of enterprise*. Chichester [England], New York: Wiley. (Figures 21 and 51 republished with permission of John Wiley and Sons Inc. and the permission conveyed through the Copyright Clearance Center, Inc.).
- Espejo, R., & Reyes, A. (2011). *Organizational systems: Managing complexity with the viable system model*. Heidelberg, New York: Springer.
- Lynn, J., & Jay, A. (1989). *The complete yes prime minister: The diaries of the right Hon. James Hacker*. London: BBC Books.

“Looking Outside”— The Strategic Metasystem (Part 1)

6

You cannot discover new oceans unless you have the courage to lose sight of the shore.

(Anonymous)

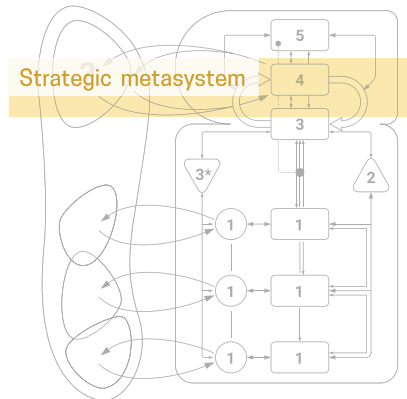
Innovation is anything, but business as usual.

(Anonymous)

One can also assess the viability of an organization by how much the organization can change itself and its environment. However, what are the necessary organizational processes and preconditions for a change? This will be the guiding question for this and the following chapter.¹

With this question in mind, we have now reached the **strategic part of the metasystem**, which consists of system 3 and 4 and their mutual interaction (see Fig. 6.1). The distinction between an operational and strategic part of the

Fig. 6.1 The strategic metasystem—contains adaptation from Beer (1995a: 136, Fig. 37)



¹ All figures in this chapter related to the VSM are or contain if not stated otherwise adapted detail views from Beer (1995a: 136, Fig. 37). For the corresponding permission details, see the reference section at the end of this chapter.

metasystem highlights the fact that two differently functioning spheres are operating in the metasystem.

Whereas the operational part of the organization (system 1, 2, 3 and 3*) operates in a rather stressful and loud environment and focuses on very concrete and practical problems of the organization’s daily life, organizations need another group of processes that keep an eye on the broader issues and trends in the future. This strategic part (system 3 and 4) needs silence, distance, and the possibility of reflection. In a way, we can say that the strategic metasystem works metasystemically to the operational metasystem (Beer 1995a: 129); it focuses on the bigger picture and patterns of the operational metasystem’s tasks.

6.1 System 3’s Double Nature— A Challenge, but also the Source of Its Power

Why does system 3 appear both, in the operational as well as in the strategic metasystem? Is not this a design mistake in the VSM? This “mistake” reflects a vital aspect in organizations: the **double nature of system 3**. System 3 is responsible for the operational business, but it is also involved in the strategic development of the organization.

Let us take a typical system 3 process such as the budgeting process: the allocation and planning of resources appear to be purely operational and tactical issues. However, every budget always also has a strategic dimension: the decision about which product or unit receives how much budget or what kind of resources influences at the same time the future development and strategic orientation of this product, unit, and, in the end, the entire organization.

For many executives and managers this double nature is a challenge: on the one hand, they need to understand operational details, and yet on the other hand, they must think strategically and in broad terms. Only a few succeed in combining both and bridging the different perspectives. Many either remain too involved in operational problems or shy away from operational details because they are interested only in the bigger picture. System 3 always has two dimensions, and executives need to know how to balance them out in their daily schedules.

At this point, we touch a unique aspect of system 3’s position within the organization, to which the VSM points us (Beer 1995b: 263): **system 3 is the only connection between the operational organization and the strategic metasystem**. It alone sees all aspects of the operational organization (systems 1, 2 or 3*), and the strategic and normative metasystem (system 4 or 5). If system 1, 2, and 3* need information on the strategy, they need to go through system 3, and vice versa, system 4 and 5 can only obtain all the information related to the operational organization through system 3.

This **gateway position** can easily be observed in strategy projects: those involved in developing strategies get only access to operational data through those who manage the operation, such as the director of operations. Here lies a considerable risk buried because the question arises what kind of data the operational management will want to make available to the members of the strategy project. It will certainly not grant access to the data that challenge the current mode of operation. The strategy project consequently depends on the goodwill of the operational units which by choosing the data can influence the further course and decisions taken in the strategy process.

This unique position of system 3, however, also has a positive function for the **strategic metasystem** (Malik 2008: 125), since it also acts as a filter (Beer 1995c: 140f). If every information on the operation were transmitted to the strategic metasystem, the latter would be quickly overwhelmed and distracted. System 3 preselects and filters the data in such a way that the strategic metasystem can focus on the salient points. An operational metasystem that filters data and information well is the prerequisite that **the strategic metasystem can stay cool**.

6.2 System 4—Why We Need It and What It Does

System 3 is one part of the strategic management; the other element is system 4. However, why do organizations need a system 4? Would system 3 not be sufficient? The reason for a system 4 lies in two limitations in the organization as far as we have described it:

1. **The environments of the systems 1 are only parts of a wider environment.**

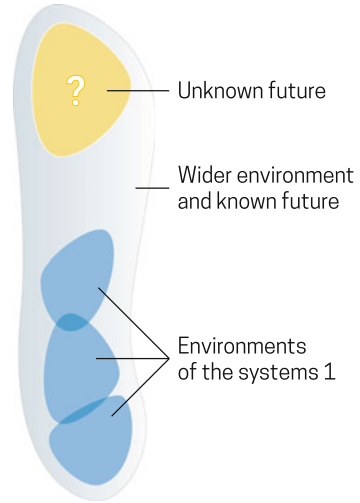
The specific environments of systems 1 do not contain the entire world. They are always embedded in a wider environment, and this wider environment is larger than just the sum of the systems 1's environments (Fig. 6.2). It includes, at least, the society, state, and the economic system, in which the organization operates and is embedded. Systems 1 must focus on their specific environment, but if their narrow perspective prevails, the whole organization will become too parochial. This will prevent the organization from recognizing broader and more fundamental trends that might one day surprise the organization.

To preserve their viability, organizations need to go regularly and systematically beyond their immediate and current environments. To this end, they need to develop a specific function that works like an organizational "look-out" post (Fig. 6.3).

2. **Organizations are not static; they operate in time and must continuously bridge the present to the yet largely unknown future** (Beer 1995a: 120).

To build this bridge into the wider environment and future, organizations also need functions, processes, and competencies different from those that are required to manage the current operational business. System 3 cannot do this: people who

Fig. 6.2 Elements of an organization’s environment



are good in operational details often have difficulties in thinking in broader contexts and, vice versa, people with a global perspective lack the passion for the finer details of the day-to-day operational work.

The two limitations mentioned above lead us to an important distinction made by Stafford Beer that determines the way in which system 4 needs to function. For Stafford Beer, system 4 must deal with two different types of environments (Beer 1995b: 227 and Fig. 6.2): The **wider environment** and the more-or-less already known immediate future on the one hand and the yet **unknown future** on the other hand. Whereas planning, simulation of scenarios and forecasting are the main processes for the already known wider environment, the unforeseeable future needs different instruments. The only thing that one knows for certain about the unknown future is that it will most likely be different and that current trends do not allow us predicting it. We laugh today about predictions such as the one made by IBM Chairman Thomas Watson that “... there is a world market for maybe five computers.” (Carr 2008), but at his time this prediction sounded reasonable given the

Fig. 6.3 Every organization needs a “look-out” (© Fotolia/stock.adobe.com; artist(s): Bernd Jürgens)



computer technology available. The problem of all these “forecasts”, plans or simulations is that they do not take into account human creativity and its ability to change the course of the world. For the unknown future, organizations consequently need different kinds of sensors as well as creativity to achieve requisite *eigen*-variety.

Taken together, some of the key instruments for system 4 regarding the environment and future are the following (see Table 6.1)²:

Table 6.1 Instruments of system 4 regarding the wider environment and unknown future

	Required sensors ^a	Main instruments
Wider environment and almost known immediate future	Sensors to the wider environment and already recognizable future	<ul style="list-style-type: none"> • Planning • Simulation • Forecasting
Unknown future	“Sensors” to the new	Generation of internal variety through creativity methods, out-of-the-box thinking, and innovation processes

^a For the distinction of these sensors, see Beer (1995a: 120)

But capturing and preparing responses to the environment is not all of what System 4 must accomplish: one key challenge to System 4 is that it does not consist of one but many different eyes (e.g., marketing, R&D, corporate controlling) that watch the environment and future and generate their specific image of the outside. Thus, system 4 must also process all the different information, facts, ideas, and stimuli that it receives or generates. It must yet construct a common picture and decide on which issues it should concentrate (“Focus”³). It then must compare this outside view with

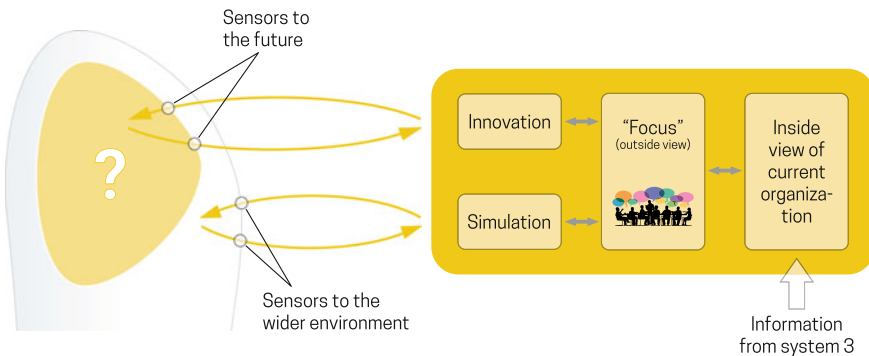


Fig. 6.4 Core processes of system 4

² This does not exclude the use of innovation and creativity for the known future (see also Beer 1995b: 227).

³ Stafford Beer called this part of system 4 its “model of itself” (1995a: 115). Since this may sound a bit too abstract for many readers, I searched for a more descriptive name of the actual process. I chose “Focus” following Beer’s own description (1995b: 242), where he calls this “mode of integration” as “focus” (see also the term “kernel of the focus” at *ibid*, 240).

its view of its internal functioning and current state (“Inside view”). Diagrammatically, the core processes of system 4 can thus be depicted as in Fig. 6.4.

We will discuss these core processes in greater detail in Chapters 6 and 7: in Section 6.3, we focus on the sensors to the wider environment and simulation. In Section 6.4, we discuss the sensors to the unknown future and the innovation process. Section 7.1 explores the process of gaining “Focus”. In Section 7.2, we discuss the interaction between the outside view obtained by system 4 and the inside view of system 3. From there, we will then discuss the specific challenges of system 4 (Sections 7.3 and 7.4). This will lead us to the final question about how the interaction between system 3 and 4, and thus, how the organization’s central organ of adaptation should be designed (Section 7.5).

6.3 System 4—Monitoring the Wider Environment and the Almost Known Future

As we have mentioned it above, system 4 is the organization’s outlook post into the wider environment and known future. This needs time, dedication, and a systematic approach. No other system function can execute this task: either they are too occupied with the internal functioning (system 2, 3 and 3*) or focus only on a smaller segment of the environment (systems 1).

We are interested in two specific processes (Fig. 6.5): first, the sensors of system 4 and second, the mechanisms by which it develops possible responses such as simulation of scenarios. This will be the focus of the following section.

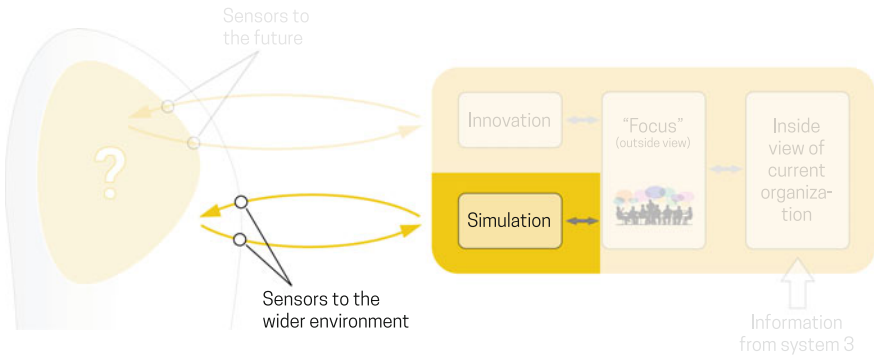


Fig. 6.5 System 4 sensors to the wider environment and the simulation process

6.3.1 “What Is Going on Out There?”— Sensors to the Wider Environment

Similar to the environments of the systems 1, the wider environment is mostly intransparent to the organization. This forces the organization to install special **sensors and interfaces**. These sensors and interfaces can be manifold, for example, memberships in trade associations, contacts to business and political networks, external consultants, trade fairs, or simply reading newspapers and the Internet. These sensors are not a nice-to-have but are vital for the adaptation and strategy of the organization.

Often these contacts are only used as one-way channels to present the organization and to project itself and its products to the environment (e.g., fares). Organizations often do not sufficiently capitalize on the opportunity that every contact with the outside world is also a chance to learn something new about the environment. Too much emphasis is placed on presenting the organization; but “**listening**” and “**asking**” are equally important interaction modes with the environment. In particular, larger organizations are often too much preoccupied with their inner life that they forget about their sensors to the outside world. Organizations should thus regularly check, whether they are sufficiently listening to the outside world (i.e., have the right sensors and the information channels from these sensors into the center of the organization).

Organizations do not only collect information; a considerable portion of their energy is also spent on **processing and assessing the data** regarding their **relevance**: what do these changes in the environment mean and imply **for us**? As stated earlier: the environment is initially nontransparent to the organization and the organization must yet make sense of all the data that it receives and almost overwhelm it. What is the “message” behind all the signals that we receive? Is it true, what we think that we have understood and what does it mean to us?

The inherent uncertainty about the validity of its interpretation forces the organization to perform another vital process: it is not sufficient anymore to evaluate just the data. The organization must evaluate itself regarding its assessment and evaluation capabilities—it needs to undertake a continuous **self-check of its interpretation patterns and relevance filters**. Sometimes, we are questioned by superiors about our assessments and whether we are sure about our interpretation of events in the environment. We tend to take this personally, but, we should not: every organization must or, at least, should scrutinize itself regularly regarding its interpretation accuracy. Scrutinizing itself helps the organization to evaluate, whether its analytical and judgmental capabilities still match the variety of the environment (here again: Ashby’s Law).

6.3.2 “Which Future Do We Want?”— Modeling and Simulation of Scenarios

When the organization believes its interpretation of the outside world and the changes lying ahead, the next question then arises as to how to react to these changes. What options are available and how do they feedback to the organization and its viability? Changing one’s course is risky: one often cannot go back and undo changes.

Nature has overcome this problem through evolution, i.e., a species produces uncountable mutations of which most will not survive; hence, only some of the fittest will be selected. Through this massive and costly trial-and-error-procedure, a species finally survives. The problem of an organization, however, is that it is not a species and that itself wants to survive. It does not help a publishing house to know that the species of publishing houses might survive in the long run when it runs into bankruptcy and liquidation due to an unfortunate technological change such as the digitalization.

For Stafford Beer, organizations solve this problem by internalizing and virtualizing the evolutionary process (see Beer 1995b: 230). This internalization of the evolution process happens through the creation of models, scenarios, and simulations that allow the organization to test the effects of different options (Fig. 6.6). Through **imagining different scenarios or futures**,⁴ the organization models the possible evolutionary process ahead of it without taking any risks. From the perspective of Ashby’s Law, scenarios are hence nothing else than a virtual



Fig. 6.6 Through scenarios and simulations organizations multiply imaginarily themselves into the future (© Fotolia/stock.adobe.com; artist(s): Iko)

⁴ The term “imagination” is used intentionally, because it reminds us that all scenarios are, in the end and despite all the methodological rigor and the analytics applied to it, only built on the organization’s imagination.

multiplication of the organization into different possible futures. Scenarios are an instrument for an organization to increase its *eigen*-variety.

6.4 System 4—The Organization’s Interface to the Unknown Future

The wider environment and the relatively known future are mostly concrete, and observable. But, how to address the unknown future? We will pursue this question in this section. Again, we will first focus on the sensors and then on some of the mechanisms, by which organizations attempt to develop responses to the unknown future (see Fig. 6.7).

6.4.1 “Nobody Knows, What Will Come”—Sensors to the New and Unknown

“Sensors” to the unknown future are confronted with a fundamentally paradoxical problem: how to capture something that cannot be recognized at all? Identifying trends does not help because visible trends are only present trends that can be different from future ones. As the saying goes: “Predicting the future is easy ... getting it right is the hard part.” There is only one thing certain: the future will be most likely different from what we expect it to be. Hence, the only possible measure consists of learning as early as possible from the surprises that might come, so as to increase the available response time.

The problem is that the new future might first become noticeable in any place of the organization, might need a different pair of mental eyeglasses to be perceived and might develop in a place in this world that we do not know beforehand. Thus, organizations can and should implement at least the three following measures:

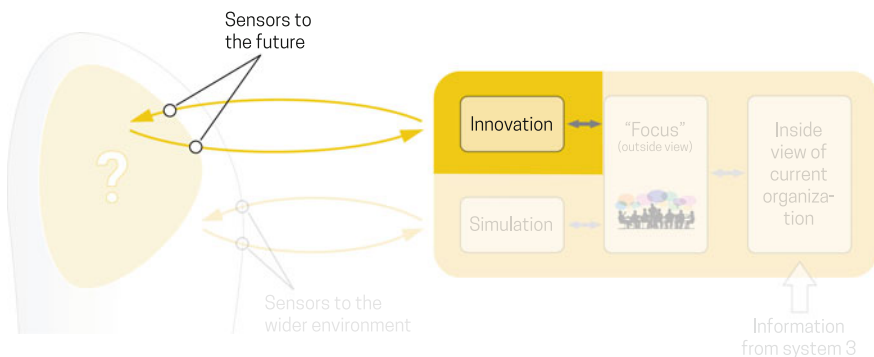


Fig. 6.7 Systems 4 sensors to the future and the innovation process

1. Raising **awareness and alertness** within the entire organization.
2. Increasing the **ability to question existing perception patterns and the versatility to develop new interpretation perspectives.**
3. Exploring **challenges and inefficiencies** in today’s world and giving **randomness** a place.

What do these measures mean concretely?

If you want to know more about them, then continue reading here, otherwise, go to Section 6.4.2

1. “Who watches the future?”—Increasing awareness in the entire organization

One cannot change the unknown future, but one can try to increase the response time that one has left: the earlier new developments are identified, the easier it is to react. Medieval cities used guards on towers and scouts who looked far out into the space surrounding a city. This increased the disposable response time. However, who are these “scouts” and “guards” in organizations and how can one ensure that their messages get to the control center of an organization promptly?

This is not a trivial problem for organizations. One can nominate “scouts” and “guards”, such as experts in specific issues, but since the future is still unknown, the organization does not know beforehand and has no way of knowing who will receive the signals on new developments first. Other employees than the nominated “guards” could become aware of changes. Against a widely-held belief, the environment and future do not necessarily follow the structures and processes put in place by the organization.

This leads us to the core of the problem: employees who might notice new trends do not know that they possibly function as guards for their organization and should report their observations. Imagine a purchasing manager who while shopping on the internet in his spare time sees a device with an innovative technology potentially relevant for the organization. Will he report it? In most cases not, because he might have difficulties recognizing the relevance and, even worse, he might not know to whom to report the information. It is a recurring experience in organizations that in hindsight much information on new developments has already been known by someone in the organization and, even more tragically, could not be brought to the attention of the organization or only too late. The new future might even be part of the organization. How many companies made the experience that later competitors came from the ranks of their staff who left because no one listened to them?

Hence, a well-functioning system 4 has no other choice than to make the entire organization aware and alert. For this, it needs to implement specific

information channels and networks to reach out. Standard measures such as internal employee information web pages are possible ways. However, they can also fall short, because they are often too general or do not engage employees personally and are thus ignored. Another option is to use internal social network platforms to raise awareness and provide possibilities for employees to post interesting information with regards to the environment.

Perhaps the best way is to discuss the latest developments with employees personally as much as possible. Walking through the company and talking to employees first establishes information channels to people directly. Second, the personal discussion also activates their involvement and perception. Discussion lets them see events in a new light. William Edwards Deming once stated pointedly: “If you wait for people to come to you, you’ll only get small problems. You must go find them. The big problems are [the ones] people don’t realize they have in the first place.” (quoted in [The Economist 2008](#)). Only through talking with each other, does one realize what one has observed. In the dialog with others, observations obtain their relevance and become interconnected to form a broader picture.

2. “We have seen nothing”—the need for different perspectives

Organizations must also ensure that employees are sufficiently **alert to new developments** (Beer [1995a](#): 120). Nominating guards does not suffice; it additionally needs the corresponding attitude. However, how does one make sure that employees are vigilant? This puts organizations into a paradoxical situation since one knows that one did not miss new developments only with hindsight—and this might be too late.

If the future is different from our current assumptions, then we must purposely expose our actual image of reality to different angles. If one sees “nothing new” this does not automatically mean that the new does not yet show up. “Opportunities” in strategy making emerge precisely when one company detects a possibility to create value that no other company has yet seen and exploited. Thus, it always depends on one’s **perception patterns and capabilities**, as to whether one sees nothing or, instead, a chance or threat.

The challenge then lies in continually questioning one’s perception patterns and to understand how to question them. Alfred Sloan, who led the foundation for General Motors’ later growth, once closed a board meeting with the famous words:

“Gentlemen, I take it we are all in complete agreement on the decision here. Then, I propose we postpone further discussion of this matter until the next meeting to give ourselves time to develop disagreement, and perhaps gain some understanding of what the decision is all about.” ([The Economist 2009](#))

In our fast-moving world where nothing is granted, organizations must rigorously question themselves and their business model. How would we design our business, if we could start again from scratch? This requires a

good and in-depth knowledge of one own’s business model, but one also needs a good amount of imagination, to understand what other possibilities exist. The filmmaker Eastman Kodak built its business model on the Gillette-principle, whereby the cameras served as a means to sell Kodak films. That one could earn money by selling cameras, seems to have been unthinkable to Kodak. (Knowledge@Wharton 2012).

Thus, a well-functioning system 4 must **cater to a sufficient variety of perspectives within itself and the organization**. Only with enough **different cognitive perspectives**, will the organization have a chance to become sufficiently alert and achieve requisite variety for the environment and the changes lying ahead. This should be one of the core elements of the much-advertised management skill “agility” today. Agility does not only mean to change faster but also to see and make things differently. **Versatility is thus the complementary competency to agility**.

Training versatility should be a vital part of a company’s management education and not be treated as peripheral, especially in fast-changing times like ours. One must continuously expose oneself to opposing views (“contrarian thinking”). Only then can one learn to change perspectives and develop a new and fresh viewpoint on a matter. The **internal variety of perspectives** can be promoted and cultivated in many different ways that include external experts, actively listening to and discussing outsider opinions, and taking care of sufficient diversity in various decision-making bodies.

To elucidate what we have just discussed better: the purpose of diversity is not diversity itself. The diversity of perspectives is not an end in itself. Diversity has the purpose of ensuring that the organization, its executives, and employees can understand, in Sloan’s words, a matter correctly. Diversity is only the means to make one’s perception, sensors, and patterns more receptive or in Sloan’s words: **to know what the decision is about**.

3. Today’s challenges are tomorrow’s inventions—The quest for challenges and the value of randomness

Another option to better anticipate the unknown future is to come closer to it. This sounds paradoxical since one cannot shorten the distance to the future. The future is and always will be the future. The point behind this provocative statement is that even the unknown future is already in preparation somewhere. Thus, if one wants to shorten the distance one needs to find the places, where the new future is already starting to emerge. Similar to what Schwaninger (2006: 183) rightly pointed out: “The basis of effective time management is starting earlier, not acting faster”.

Where are the places to look for the unknown future? The obvious places (and perhaps a little too obvious) are, of course, universities and research labs, or other “**hot spots**” dealing with advanced technologies and business models such as the much-acclaimed Silicon Valley. However, one

should not be too restrictive and just walk on the beaten tracks to these iconic “pilgrimage sites” and modern versions of the oracle of Delphi to seek advice on the unknown future. Innovations emerge in many other places, especially where enormous **problems** still exist and to which **no solution has yet been found**. Many innovations are in fact a reaction to burning issues. Not only new technologies but **also challenges and problems are the sources of innovation**. The idea for Uber was born out of the concrete personal experiences of its founders with the short supply, inefficiencies and quality problems of the taxi markets of San Francisco and Paris (Stone 2017; Uber 2018). **Not only new technology, but also problems and challenges lead to creative ideas** and in many cases, only the need for a change provokes a change. Thus, who is curious and tries to understand the inefficiencies in this world, be it countries, industries or the various sectors of societies such as health and education might get a better idea of what will change in the future. In the end, inefficiencies and practical problems are the areas where change will happen.

Innovations and changes can come from anywhere in a globalized economy: the generation of good ideas is not limited by geography. Thus, one needs to get up and leave the home base to understand the major problems and find the sources of change. This points us to one important instrument that is often overlooked and not sufficiently exploited by organizations: **(business) trips**. Trips cost and take time, but they are also valuable instruments to extend the range of an organization’s sensors and perception. Thus, journeys into different parts of the world should be systematically undertaken to understand better into which direction the future might develop. They are also an opportunity to harvest or develop ideas.

In this process, one should give **chance a chance** and have, for instance, a journey not planned out in detail beforehand: for the unknown future escapes every planning. The best chance to meet the unknown is to include the unknown in one’s plans. One must thus provide enough room to meet the unknown and unplanned by not having planned a journey fully in advance. Who plans, can only plan for the known. For the unknown, one needs to reserve time, openness, and flexibility to let oneself guide by the surprises and discoveries on the ground.

For a long time, “management” was equated with “planning”; in this approach, however, the unknown cannot be met appropriately. It only becomes noticed and immediately discarded as a “nuisance” that needs to be avoided or corrected. But, the nuisance caused by not-anticipated factors might be the faint signal of the still unknown and different future that one is looking for. One needs to give these signals a chance to be better understood. One should resist the temptation to wipe away unwanted disturbances in one’s plans and instead ask oneself: “What does this “nuisance” tell us about our environment, and about how we perceive and interpret it?” Perhaps, in this “nuisance” lies the unknown future and the golden nugget hidden that you were searching for all along.

6.4.2 Creativity—The Unknown Future Lies in One’s Hands

The life of organizations is often compared with the biological evolution process, in which only the “fittest” survive. However, what does “fittest” mean for the unknown future? To focus on being the fittest works only for the current environment and the foreseeable future. To be “fit” might mean something entirely different in the future. Focusing only on current challenges and optimizing existing products, technologies, processes and business models might not work for the unknown future; it might even be fatal.

If the future is different, then one can only prepare oneself to it not by continuing with the same instead, it is better to broaden and diversify the range of possible alternatives of how to proceed in the future. In doing so, one must create and invent new options that differ from the current ones. In the language of the VSM, this means that the organization must increase its *eigen*-variety. Only with more *eigen*-variety, will an organization find it easier to confront the new external variety, whatever it might be. In simpler terms, an organization that has generated more and better ideas and options will have a better chance to survive than one that does not stimulate its conceptual and mental variety. Creativity and innovation are the “engines” that stimulate the organization’s *eigen*-variety and prepare it for the unknown future.

In view of Ashby’s Law, it is not surprising that in fast-changing times like the present, innovation and creativity are a top priority for organizations. As the variety of the future increases and becomes less predictable, organizations must increase their *eigen*-variety through innovation and creativity so to become better prepared. Only then they can fuel their rate of change to the necessary level demanded by their environment. As Jack Welch, the former CEO of GE once put it famously in his annual report of 2000 (GE 2001: 4): “when the rate of change inside an institution becomes slower than the rate of change outside, the end is in sight.”

However, creativity is not only about protecting oneself and fending off dangerous developments. This is still a too passive perspective: the unknown future is also an open space that invites the organization to be shaped and modeled. The future is not just something that one needs to follow passively like a spectator. It can and should also be created by the organization: the **unknown future is thus not only a threat but also calls on the organization’s creativity** and presents a chance to identify spots where it can create value. To shape the unknown future by identifying yet unsolved problems and inventing new solutions belongs to System 4’s responsibility (Beer 1995b: 227).

Hence, there is a chance that the environment’s unknown future of the environment might even start in one’s organization, as we have already pointed out above. Creativity and innovation are thus processes that allow an organization to **reverse the adaptation process**: not that the organization is then adapting to the environment anymore, but rather the environment is following the organization and its variety. This reversal of the adaptation process is the rationale behind the famous

phrase “the best way to predict the future is to create it.”⁵ An organization needs to strive to become **the future of its environment**, the place where the future happens. As Jack Welch put it (*ibid.*, 4): “We’re no better prophets than anyone else, and we have difficulty predicting the exact course of change. But we don’t have to predict it. What we have to do is simply jump all over it!”

**Do you want to know more about some of the prerequisites for generating creativity?
Then continue reading or else go to the end this chapter.**

6.4.3 Prerequisite for Generating Creativity

What are organizational prerequisites for creativity and innovation? Here are some ideas and remarks:

1. Different perspectives—the new “raw material” of the 21st century

One must first understand closer what innovation is because the term “innovation” entails in most cases already a positive connotation and a certain degree of appreciation. This hides its true nature and the challenge of every innovation, namely, that they are initially not yet recognized as such. Every inventor knows that he or she must still earn this title. Without the appreciation and recognition as “innovation”, the innovation is for everyone else just something “different” and “other” than the usual.

At this point, we touch one critical aspect of innovations: if “being different” is one of the key characteristics of innovations, then this implies that **the generation of differences lies at the heart of innovation processes**. Having a new idea requires that one can see something different and differently. This is less than obvious and easy, in particular, from an organizational standpoint. Organizations still tend to have difficulties to generate and digest “otherness” and “differences”. Their main effort is directed toward creating order, predictability, and stability into the complexity of its environment (Thompson 2003). This is after all what “organizing” also means and what is quite rightfully needed: for without order, there is no progress. Creating something new and different thus runs counter to the nature of the organizing process and its attempt to build robust organizational structures. As Jack Welch, the famous former CEO of GE, put it (GE 2001: 4): “Learning to love change is an unnatural act in any century-old institution.”

⁵ This quote is often attributed to Peter Drucker. In fact, it seems to come from the Nobel prize winners Dennis Gabor and Ilya Prigogine (s. quoteinvestigator.com).

Organizations thus need to be aware of their tendency to homogenize. They need to do everything to overcome or, at least, to control this initial impulse for order. They must commit themselves to promote differences and different perspectives. They need to allow themselves to become reinfused with differences, or in the VSM language, variety. This is important for their survival: who always sees just the same things and does not become exposed to other perspectives cannot be expected to become innovative. **Different views and ideas are perhaps the most precious raw material** in today’s fast-changing environment.

How then can organizations access and cultivate this critical raw material called “difference”? For example, through different people and this immediately relates us to an organization’s explicit and, even more importantly, implicit HR policies. If companies hire people, one of the underlying main evaluation criteria of assessors is often, whether the applicant “fits the organization”. There is undoubtedly some value in it since shared values and culture reduce oscillations in the organization (see system 2). However, if employees are too similar, from where then should new, and different ideas come? This requires opening boundaries and letting other people in, such as applicants with different mindsets and have them welcomed.

To open boundaries also means to invite “outsiders” such as external experts and customers (“open innovation”) into the organization. Talks with and presentations by people from other fields and disciplines are also an instrument to stimulate and fertilize the *eigen*-variety of the organization and its employees. Sending employees and especially decision-makers in an organization to congresses, where they can expose themselves to different thinking, new worlds, and new insights are not a luxury or incentive but a must today. **“Diversity” needs to be nurtured and cultivated in organizations!**

2. Innovations are social processes ... and must be organized as such

Today, we come to recognize that innovation does not just happen in secluded rooms. If we let diverse people only sit around in their offices, it is likely that not very much will presumably happen. “Differences” (or new ideas) are often born through social processes, for instance, when people sit together and discuss an issue or exchange views (see, e.g., Wuchty et al. 2007). Someone has an idea that triggers another idea, which, in turn, stimulates again someone else to develop the final idea that becomes the basis for a new product. As an organization, one must promote this “chain reaction of ideas” by continuously bringing people together and fostering the exchange of different perspectives as much as possible.

The generation of ideas is only one aspect of why social processes are important for innovation; the other equally important one relates to the usefulness and acceptance of innovations. As we said earlier, innovations are first only something different and still need to become appreciated by others so as to become recognized as “innovations”. Innovations must thus also be geared toward the needs of others, and this can only be done in exchange with other people. **Innovation is not only an intellectual but also a social process** and needs to be embedded into a social context to become beneficial.

This brings us to our next point, the operational organization has its institutional spaces and organizational structures, but system 4, in most cases, does not. To develop ideas and make them fruitful for the organization, they need to be placed in the right social context and structure. For this, ideas need an institutional framework. Thus, they require spaces and places within the organization, be it spatial, institutional or temporal, where ideas can grow and gain in value and acceptance through a mutual exchange process between people.

Devising such frameworks and structures is tricky due to the nature of innovations and ideas: they can emerge everywhere, and often one does not know where. Formal organizational structures thus may not fully capture the innovation potential of an organization. How many ideas have been developed just because we met people by coincidence? It is therefore not surprising that companies discover that even processes that appear to be inefficient such as talking to each other without any preset objective and agenda can be important for generating innovation and capturing ideas born in the organization.

The advantage of these highly unstructured and not predetermined processes is that they allow a high degree of thematic variety and offer the possibility for people to build up unexpected connections between diverse topics. With a rigidly structured agenda and communication protocol, this is less probable: one gains regarding the depth of a specific topic, but not regarding the connection between a variety of topics.

Stafford Beer once remarked that the most stimulating and innovative aspects in conferences are not the official contributions by speakers, but rather the accidental talks in the corridors and breaks. However, where would be the breaks mentioned by Stafford Beer without the formal structure of a conference? It needs both, formal meeting structures but also ample opportunities in these structures to meet informally and exchange spontaneously.

Thus, the creative and innovative part of system 4 should be designed so that it contains **three organizational mechanisms**⁶:

⁶ For this thought, I am in particular thankful to Prof. Patrick Cohendet, HEC Montréal. See also the papers by Cohendet et al. (2010a, b).

1. Mechanisms that facilitate the **informal encounter of employees** and thus the formation of **informal communities** that allow like-minded employees (and even outsiders) who share the same passion and purpose to develop ideas together. These communities should allow exchanging ideas and exposing people and their creativity to the social dimension.
 2. However, it also needs **formal structures** that ensure focus, connect ideas and innovations to the operational organization and monitor the implementation of innovations. These formal structures are R&D departments but also projects with formal innovation processes.
 3. Finally, one needs **connection channels or meeting platforms** where the different communities and the formal structures can meet and exchange (e.g., conferences on certain topics). These platforms have five positive effects: first, they overcome silo-mentalities that can even emerge in communities. Second, they relate every potential innovator and invention back to the entire organization and help realign it with the organization’s purpose. Third, they allow sensing the breadth of topics and hence the (*eigen*-)variety available in the organization. Fourth, such platforms make it possible to create a common picture (see next chapter). Fifth, they connect the more informal world of the company’s individual innovators and communities with the formal organizational structure.
- 3. The old and the new business—the organization’s chalk and cheese**

Since differences are always strange and provoke uncertainties, innovations face misunderstandings and an uphill battle before they can establish themselves. This brings us back to one of the most critical questions in organizational design, namely, the relationship between the new and the old, i.e., the new products and the traditional business within an organization. We will briefly discuss three aspects of this relationship: (1) organizational structures, (2) control parameters, and (3) personal behavior.

One of the reasons, why Eastman Kodak, this icon of physical film-making, did not survive was that it worked isolated from other technological developments, most notably those in the digital field such as in Silicon Valley. The surrounding working culture and atmosphere of the traditional Kodak business units in Rochester, a major US manufacturing city, whose boom years spanned from the nineteenth until the middle of the twentieth century, did not favor the development of start-ups needed at the end of the twentieth and beginning of the twenty-first century (Knowledge@Wharton 2012). This implies that innovation and new business fields, if too different from the core business, should be removed from their usual environment so that they can develop (similar Hoverstadt 2008). They need **different** organizational **structures and settings**.

However, this separation of the old and new does not only apply to organizational structures, but also to the way the new fields of activity are

controlled and managed. One cannot control the new with the same KPIs as the operational business. Innovation needs generosity and a ludic drive with sufficient curiosity and eagerness to try out new ideas. Nature itself is very generous in its variations. A species produces so many “test runs” and trials that one can only be amazed at the waste that is produced as a result. Organizations too must understand, that with criteria too closely linked to efficiency and effectiveness the curiosity, creativity, and eagerness to experiment can be stalled. System 4 requires when it comes to the creation of ideas, a set of **control parameters and measures different from the operational part** of the organization.

Last, innovations are risky, especially for the inventor personally. One condescending smile or frowning can kill them and not only the proposed innovation but also the future willingness of other people to innovate. One learns from how others are treated (e.g., if they are regarded as foolish when they present a new idea). If organizations want to nurture innovation, they must also work on the **(inter-)personal level**. So, “foolishness” should not be punished if the honest intention was to help the organization with an innovative idea. And, who knows, the world is full of inventions that were originally deemed as foolish and became later the new wisdom.

Summary

- System 3 is double-natured: on the one hand, it is oriented toward the operational dimension of the organization, on the other hand, it must participate and actively engage in the development of the organization’s strategy and reinvention. Its challenge is to find the right balance between both dimensions.
- System 3 exercises a filtration and gateway function between the operational body of the organization and the processes that focus on the strategic and creative development of the organization. It must ensure that not too many data and information reach the strategic processes of an organization, but that they still obtain an accurate picture of the operational organization.
- Organizations must develop a system 4 that allows observing the wider environment and known future as well as co-creating the unknown future.
- To this end, system 4 needs adequate sensors and instruments to generate the necessary *eigen*-variety within the organization (Ashby’s Law). Concerning the known immediate future, these instruments are mainly planning, as well as modeling and simulation of scenarios.

- Regarding the unknown and yet to be created future, organizations must make their employees aware of their potential guard function. They also must change their perception patterns (versatility).
- Also, organizations must increase their *eigen*-variety by promoting and activating their creativity and innovation capabilities. For this, organizations must promote different perspectives and encourage employees to share them within the organization. Organizations need to provide institutional spaces for creativity and promote curiosity and willingness to experiment.
- For innovation and creativity to develop, organizations need to develop system 4 specific structures, control mechanisms, and personal behaviors.

Questions for Reflection:

1. How well does the operational metasystem in your organization filter information for strategic discussions and decisions? Are you flooded with information and data or do you have the impression that essential data are withheld? How much are the data and information used for political power games in your organization to influence the future direction of your organization?
2. How could one design the business model of your organization differently? Has this question already been asked in your organization and has it been pursued with the required commitment?
3. How alert is the organization regarding the new and different? How much are employees in your organization trained to question their perception models and think differently? How much do executives and managers “walk through” their organization so as to detect new information from the outside world and new ideas?
4. How much are different perspectives and thinking promoted in your organization? How much can creativity flourish in your organization?
5. How much is the innovation process socialized in your organization or does it still follow the “lonely genius”-model?
6. Does the “new” in your organization have its appropriate place or is it dominated by the “old” and established business?

References

- Beer, S. (1995a). *Diagnosing the system for organizations*. Chichester [West Sussex], New York: Wiley. (Figures 7, 35, 36 and 37 republished with permission of John Wiley and Sons Inc. and the permission conveyed through the Copyright Clearance Center, Inc.).
- Beer, S. (1995b). *The heart of enterprise*. Chichester [England], New York: Wiley. (Figures 21 and 51 republished with permission of John Wiley and Sons Inc. and the permission conveyed through the Copyright Clearance Center, Inc.).
- Beer, S. (1995c). *Brain of the firm* (2nd ed.). Chichester, New York: Wiley.

- Carr, N. (2008). How many computers does the world need? Fewer than you think. *The Guardian*. February 21.
- Cohendet, P., Grandadam, D., & Simon, L. (2010a). The anatomy of the creative city. *Industry and Innovation*, 17(1), 91–111.
- Cohendet, P., Llerena, P., & Simon, L. (2010b). The innovative firm: Nexus of communities and creativity. *Revue d'économie industrielle*, 129–130, 139–170.
- GE. (2001). *Annual Report 2000*.
- Hoverstadt, P. (2008). *The fractal organization: Creating sustainable organizations with the viable system model*. Chichester, U.K., Hoboken, N.J.: Wiley.
- Knowledge@Wharton. (2012). What's wrong with this picture: Kodak's 30-year slide into bankruptcy. Retrieved from <http://knowledge.wharton.upenn.edu/article/whats-wrong-with-this-picture-kodaks-30-year-slide-into-bankruptcy/>.
- Malik, F. (2008). *Strategie des Managements komplexer Systeme: Ein Beitrag zur Management-Kybernetik evolutionärer Systeme* (10th ed.). Bern, Stuttgart, Wien: Haupt.
- Schwaninger, M. (2006). *Intelligent organizations: Powerful models for systemic management; with 6 tables*. Heidelberg, New York: Springer.
- Stone, B. (2017). Uber: The app that changed how the world hails a taxi. *The Guardian*. January 29.
- The Economist. (2008). Idea. Management by walking around. *The Economist*. September 8.
- The Economist. (2009). Alfred Sloan. *The Economist*. January 30.
- Thompson, J. D. (2003). *Organizations in action: Social science bases of administrative theory*. New Brunswick, NJ: Transaction.
- Uber. Travis and Garrett can't find a ride in Paris. <https://www.uber.com/newsroom/history/>. Retrieved from October 02, 2018.
- Wuchty, S., Jones, B. F., & Uzzi, B. (2007). The increasing dominance of teams in production of knowledge. *Science*, 316(5827), 1036–1039.

“Creating Orientation and Direction”— The Strategic Metasystem (Part 2)

7

Ideas won't keep. Something must be done about them.
(Alfred North Whitehead, Philosopher)

Greatness is not where we stand, but in what direction we are moving ...
(Oliver Wendell Holmes Sr.)

To know what will happen in the wider environment and to analyze data, to model and simulate scenarios, and finally to generate ideas is just one step. The next equally tricky step is to find out how all the different pieces of information generated along this way fit together and what they imply for the operational organization regarding the necessary changes. This part of system 4 we will describe in this chapter (see Fig. 7.1).¹

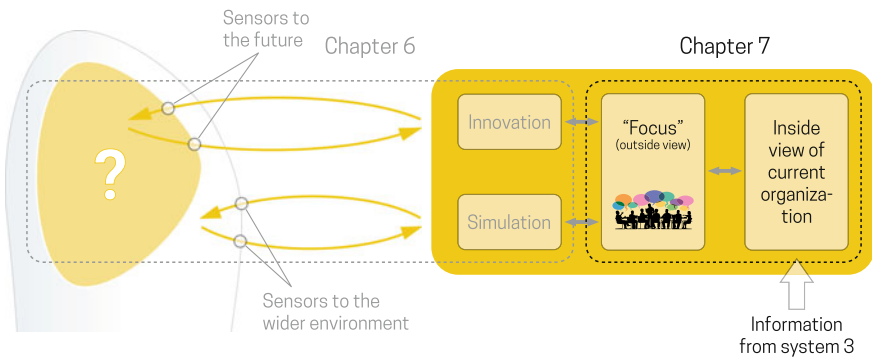


Fig. 7.1 Overview of the topics in Chapter 6 and this chapter

¹ All figures in this chapter related to the VSM are or contain if not stated otherwise adapted detail views from (Beer 1995a: 136, Fig. 37). For the corresponding permission details, see the reference section at the end of this chapter.

7.1 What Should We Focus On?— The Need for a Common Picture

Sensors, simulations, and innovations might create a very heterogeneous picture of the environment and the future. If system 4 wants to function, it must digest and consolidate all the information. Like the human eye, it must construct a **coherent picture and focus** (Beer 1995a: 113ff). This is easier said than accomplished since every corporate function (e.g., sales, production, R&D) creates its specific view on what the wider environment and future consists of and on what the organization should focus. Organizations hope that the various pictures intersect much, but often this is not the case; they still need to be consolidated (see Fig. 7.2).

An important, but often overlooked process is the construction of this common picture and focus. The picture and focus cannot be produced mechanically but instead emerge as the result of an intense discussion and reflection process. Only through debating and engaging at an intellectual level does one learn to understand the other perspectives correctly and deeply, and only then can one integrate the different and sometimes diverging perspectives. Strategies often do not become implemented or even fail because people have not understood them and their implications well enough. This superficial understanding then results in delays, costs, and errors.

Hence, it is of the utmost importance that all participants in such a process **develop this common picture and focus together**. Only, if all have gone through the same mental and intellectual process can a common picture emerge. A final presentation made by a few to many who have not participated is not sufficient to make a new strategy or change understandable.

This is also why the process of creating a shared and coherent picture cannot be delegated to some specialized units, because then again, only a few will have this common picture. Centralized units such as strategy departments can perform important preparatory work by analyzing and structuring the information, but it always needs the active intellectual involvement of those who must implement the new picture. It is this **joint reflection and debating process** that elucidates the issues to be decided for everyone. Discussions should thus not be viewed as a “nuisance” but rather as a vital clarifying, consolidation and cohesion mechanism for organizations.

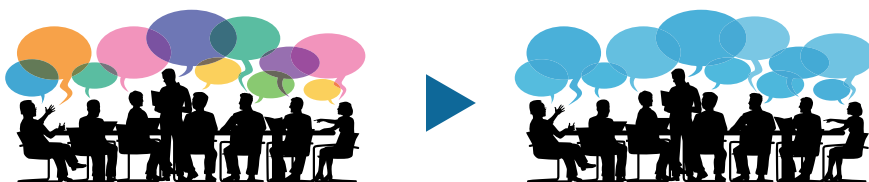


Fig. 7.2 A key challenge of organizations is to bring together the different images about the wider environment and future and create “focus” (© Fotolia/stock.adobe.com; artist(s): pict rider)

Many practices in companies still do not take the nature of this process of forming a joint view seriously enough. Annual meetings of top executives still consist of PowerPoint marathons during which one presentation is shown after the other with little or no discussion at all. Important topics and issues are still communicated by just sending out documents or presentations for everyone to study by oneself. Nothing can be more wrong and futile than these practices for both, the sender as well the receivers of these documents. Participants to a meeting need to enter a dialogue and to exchange their perspectives as much as possible to adjust their understanding to each other. This is why Stafford Beer recommended banning paper as much as possible from this process (1995b: 194).

7.2 “Reality Check”—Confronting the Outside View with the Internal Status of the Organization

The outside world is fascinating, and many interesting developments are taking place in it. It is easy to be absorbed by all the latest trends, technological advances, and new opportunities. Every one of us knows executives, managers or employees who come every fortnight with a new trend and must-do idea. Their passion for the future and outside world lets them almost forget where the actual organization stands and what its needs, limitations and true capabilities are. Consequently, a filter is needed in the form of the question: what does this mean **for us** and how does this connect to where we stand?

The information about the outside world only becomes relevant and useful, if it is confronted and compared with information from the inside world of the organization (see also Malik 2008: 128). Only in view of the internal state, can one know what is important and what one should do and what not. In system 4, hence, two different streams of information need to meet: the information about the external environment and that about the inside of the organization.

System 4 is sometimes called the “outer eye” and system 3 “the inner eye” of the organization. The pictures of both eyes must inform each other: System 3 must understand how the world has changed. However, system 4 must also understand how system 3 is working. By far not everything in the external environment or any new creative idea is or will ever be relevant to the organization or can even be implemented. **System 4 needs to understand the reality of the operational organization.** It needs to have an appropriate model of how the organization operates. If system 4 does not have this model and understanding, it will produce ideas, new products or strategies that can never be implemented by the operational organization.

System 4 must consequently balance out its innovativeness and creativity with the operational organization (here again: Ashby’s Law). Therefore, employees who are too innovative in relation to the operational organization will need to adapt, or they will become sidelined. They might even be forced to leave the organization if they cannot adjust to the variety of the operational organization. In the end, the varieties of system 4 and 3 must adjust to each other—one cannot escape this mechanism stipulated by the VSM and as a consequence of Ashby’s Law.

In which processes do we find the comparison and mutual adjustment of the internal and external picture? For instance in strategy processes, when a project team undertakes a SWOT analysis: in a SWOT analysis, internal strengths and weaknesses are identified by comparing the internal status with the external world (similar: Hoverstadt 2008).

**Do you want to know, how system 4 becomes the point, where organizational identity and the organization’s Self form?
If so, then continue reading, otherwise, go to Section 7.4**

7.3 “Who Are We?”—System 4 as the Catalyst to the Organization’s Identity

The confrontation of the outside with the inside view is not only an important source for changes within the organization; it is equally important for the **formation of the organization’s Self and identity**. Perhaps you have already experienced it yourself: journeys change us. Whoever traveled to a different place and returned home has changed his or her perspective about others and oneself. The actor Danny Key once remarked: “To travel is to take a journey into yourself.” A journey abroad it is a journey into oneself.

This also happens in organizations, and system 4 is the place, where the journey into the organization’s identity starts: in view of the external world, the essence and specific nature of the organization become clearer. The view outside of the windows of the organization raises the question as to what the organization is, what it could be as well as what it cannot be. System 4 is thus for Stafford Beer the place, where the self-reference of the organization starts (1995a: 115).

The “Self” is a reference point that the organization constructs and that gives it orientation for future decisions (see volume 2 for more details). The Self provides coherence, continuity, and stability for the organization.² It can be conceived as a system or pattern of accepted values and preferences, which allow the organization to remain true to itself and others. Whoever does not know, what one is and wants, cannot be consistent in his or her decisions.

² One should not be misled by the static term “Self”, which insinuates continuity and immutability. However, if one follows how organizations define themselves over the course of time, one notices how much their Self changes in response to environmental changes (Schwaninger 2006: 151).

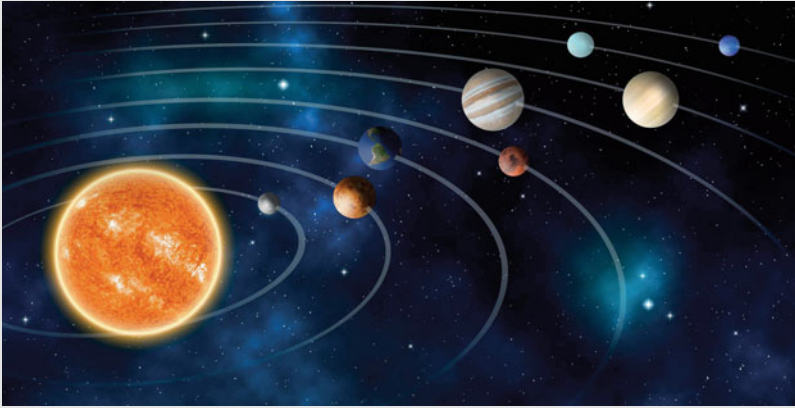


Fig. 7.3 The heliocentric world view changed the society’s self-understanding (© Fotolia/stock.adobe.com; artist(s): WithanTor)

System 4 does not only stimulate the emergence of the Self, but it also causes it to change. Innovative ideas and new pieces of information always challenge the existing Self. The heliocentric worldview was not an innocent insight; it also challenged the identity and self-understanding of the medieval society and church, and this made it so problematic (Fig. 7.3).

Innovations and new ideas thus require in many cases also working on the identity of an organization. It is always a sign of an almost inexcusable naiveté not to take this into account and to be surprised that a radical innovation might become rejected due to the organization’s identity. **System 4 hence not only needs a good understanding of the operational part of the organization, but it also needs an in-depth sense of what constitutes the Self and the identity of the organization.**

This aspect becomes even more difficult and demanding if we consider that “stability” and “change” as values are often opposed to each other in organizations. Since stability enables an organization to remain transparent to itself and calculable, organizations tend to opt for stability. If system 4 hence wants the organization to change and to adapt the organization’s Self, it needs to promise a new point of stability to the organization.

7.4 The Organizational Challenges of System 4

With this in-depth understanding of system 4, we will now turn our attention to the **specific challenges** that system 4 faces:

1. The **intangible and invisible nature** of the future.
2. The **fragmentation** of system 4 within an organization.
3. The **superiority** of system 3 over system 4.

7.4.1 “If I Cannot See It ...”— The Future’s Invisibility and Intangibility

Do you know the biblical story of the doubting apostle Thomas? If he cannot see for himself the resurrected Christ (or in VSM language: the future), he will not believe in the resurrection. The same applies to organizations: organizations and people are often like the doubtful apostle Thomas. They believe in something only if they can see and touch it.

The challenge for system 4 is a bit similar: **its “reality” is not as “real”** as the reality of the operational part of the organization (so systems 1 to system 3). The current products and machinery are always closer to the hearts and minds of the executives and employees than inventions and future technologies. A key challenge for system 4 is thus to make the wider environment and future as tangible as possible and to integrate the outside world as much as possible into the organization. The outside world must become an integral part of the organization and its perception of reality.

This aspect is also the reason why well accepted and functioning systems 4 always try to produce prototypes and success stories of their innovations as fast as possible. For Google, the immediate experimentation of an idea or the production of a prototype that can be seen and tried out is one of the cornerstones of its innovation philosophy. To this end, Google, for instance, sets up “garages” or workshops that facilitate the transition from an abstract idea into a concrete prototype (Bort 2016; Schulz 2014). However, “garages” are not the only possibility, other measures to make the future more tangible can be the exposition of new products (or other companies) or technologies in the premises of the organization. Visits to places, where the future has already become visible (e.g., MIT Media Lab) also let people touch the future.

7.4.2 The Fragmentation of System 4

Who after all is system 4? This question leads us to a challenge, with which system 4 is often confronted. Whereas systems 1 and 3 can be identified and localized relatively easily in an organization, this is much more difficult for system 4. Typically, R&D, PR, and communication, marketing or strategy departments are entrusted with system 4 functions, but in reality, we find that almost every corporate function has its own system 4. They all try to observe their wider environment and to predict or co-create the future (see volume 3).

Unfortunately, it gets even more complicated: system 4 functions are not only exercised at the top levels of an organization as the organizational chart might suggest. Often, we find relevant system 4 expertise “buried” down at lower ranks and with more junior employees. As Stafford Beer observed (1995c: 242): the younger and junior employees are the future management of the organization, though, the current top management represents only the present, or even worse, the past world.

In a utility company we found, for instance, that one of the top experts on new forms of energy was working in a customer center (because the customers were already approaching the company with related questions). Unfortunately, this employee was never invited to the strategy meetings of the top management, because he did not have sufficient “seniority”. New developments, ideas, and products often emerge at the bottom of the organization, because there the organization is much closer to the real and tangible environment than at its top. The bottom or better the operational front line of an organization receives vital impulses from the environment that could be highly relevant for the top echelon.

Consequently, we must assume that **system 4 for the entire organization is often widely distributed across the entire organization** and that the organization is mostly not aware of it. An organization’s fragmented picture of what constitutes the wider environment and future is a mirror image of the organizational fragmentation of system 4 (Beer 1995c: 231). This fragmentation hinders system 4 to recognize its scope, role, and significance and makes it challenging to system 4 to constitute itself entirely.

What makes it even worse is **that system 4 often needs a different structuring logic** than the operational organization (see also what we said earlier on creativity in Section 6.4.3). The reason for this is simple: the wider environment and the future are beyond the control of the organization, and they consist of different challenges and chances than the partial environments of the systems 1. To put it into plain language: the wider environment and the future do not follow the current organizational structure. The problems of the wider environment and future do not only need different solutions, they also require different organizational structures. Here again, we see how Ashby’s Law is operating: the variety of the organization must match the variety of the environment, which the organization’s structure must follow.

This insight often manifests itself in the calls for interdisciplinary projects and teams, and the reduction of functional silos. System 4 needs different structures than the somewhat predictably and smoothly running operational organization. The installation of R&D departments does not suffice in this regard: as an organizational parking lot for innovation and creativity they might end up as ivory towers and dream factories in the organization (Fig. 7.4). Instead, organizations need interdisciplinary communities that gather around specific problems and thereby create innovation.

What is required is that all employees in an organization start perceiving them as contributors to system 4. For this, people need to be encouraged to think more and in-depth about the future of their organization. This also requires personal



Fig. 7.4 Organizations must prevent their system 4 from becoming a detached ivory tower and dream factory (Valley News illustration by Shawn Braley)

exchanges of ideas and discussions among employees on the status of the organization; an internal webpage, email, or ideas box do not suffice.

7.4.3 The Superiority of System 3 Over System 4

Another challenge of system 4 is, and we have already indicated it in the previous Section 6.1, **its dependency on system 3 and resulting inferiority in organizational power**. System 3 possesses all information on the operational part of the organization. It alone has the overview of the entire organization (Beer 1995c: 263–265). By filtering the information for system 4, system 3 can direct or even manipulate system 4. New ideas or innovations developed by system 4 can be “killed” relatively easily by remarks by system 3 such as “won’t work”. System 4 has no means or great difficulties to falsify this assertion. The VSM makes clear that system 4 can only function properly if it gets an accurate picture of the internal state of the operational organization from system 3.

System 3 is also more potent than system 4 for other reasons: it is more visible, can act in a more coordinated way and has access and decides about the allocation of the most significant parts of resources. In contrast to system 4, system 3 earns the revenue and makes the profit in an organization in the view of many, whereas system 4 is only known for expenses in projects with uncertain results and profitability. This perception deepens the inferiority of system 4 in an organization’s internal power balance.

The **inferiority of system 4** manifests itself in many ways: limited access to resources and information, but also being exposed to control mechanisms and

expectations that are apt for the operational part of the organization, but not for innovative, creative, and strategic processes. If too constrained by the demands of efficiency and profitability, system 4 cannot work well.

What should and could be the organization’s creative “mind” then degenerates to a machine. Finding innovative ways and generating new ideas need one key resource: freedom! Freedom is the space, where the “new” can emerge. To offer freedom, means relaxing control—however, which operationally minded organization can support this?

7.5 The Interaction Between System 3 and 4— How Should It Be Designed?

For Drucker (1992), the dynamic of knowledge requires that the management of change is built into the structure of the organization. Likewise, for Stafford Beer, it became relatively clear that the interaction between systems 3 and 4 and its design have a significant impact on the ability of an organization to change and adapt to the future.³ He recognized that the classical approaches and channels like reports or floods of presentations do not suffice for what is required for this interaction. He saw that the channels between systems 3 and 4 needed a much higher variety than the typical communication channels provided in organizations. For this reason, he added an additional loop with a higher variety capacity to the standard information and communication channels on the vertical plane (Beer 1995c: 255). Broader arrows represent this loop in the shape of semicircles between systems 3 and 4 (see Fig. 7.5)

How should this loop be designed? Beer’s thinking was inspired by operations rooms or management centers (s. 1995c: 243, 258) in reference to the war rooms used in World War II. However, too fast can one’s attention be drawn to IT aspects, such as the computing power, technologies, infrastructure, and capabilities of these rooms. Beer’s concept of an operations room goes beyond that. It is instead an

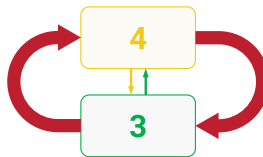


Fig. 7.5 Additional and higher variety interaction loops (red) add *eigen*-variety to the vertical information and command channels between systems 3 and 4

³ In modern organizational theory, we find the same question asked from 1991 onward in the research on the “ambidexterity” of organizations. Ambidexterity concerns the relation between the optimization of the existing business (“exploitation”) and the invention/creation of the new business (“exploration”), so between systems 3 and 4 (for this see March 1991; Stadler, Rajwani, and Karaba 2014; Turner, Swart, and Maylor 2013).

institutional space, where “**brain to brain**” can meet (Beer 1995c: 256) and where a **joint reflection and discussion process** can be initiated and maintained. This operations room is driven and kept in motion by the questions that should always be at the core of the strategic metasystem: what is our perception and understanding of the reality we face? What is truly a “fact”? What is our business model, our purpose and our valuable contribution to our environment? The operations room should be the place where “facts” are established, where strategies are developed, decisions are taken, where meaning is created, and where the different perspectives within an organization can gradually converge.

The exchange of ideas, opinions, and judgments is essential for the operations room’s success and, for this reason, all participants should be freed up as much as possible. The process should be kept as fluid as possible to allow participants to exchange continuously. This aspect is another reason why Stafford Beer recommended having any paper or presentation banned from the process because it interrupts the thinking and discussion process. The operations rooms should be a “**meeting of minds**” through which, to put it into a metaphorical language, the “**brain of the organization**” can emerge (Fig. 7.6). The operations room should be a thinking workshop (*ibid.*). Since this is an essential element for the viability of an organization, Stafford Beer spent a significant amount of time and effort to develop a framework that would provide organizations such an open, and yet very efficient process for the exchange of perspectives and the resolution of complex problems. The result of it was the synteintegration process (1994a).⁴

Fig. 7.6 The operations room should connect people so that the organization’s “brain” can emerge (© Fotolia/stock.adobe.com; artist(s): Anita Ponne)



⁴ In this book, I will not describe the synteintegration process, since it has already been sufficiently described in other books such as Beer (1994a), Malik (2011), Pérez Ríos (2012), and Schwaninger (2006) and would go beyond the scope of this book.

Continuity is a critical aspect for the successful interaction between systems 3 and 4 and often overlooked or forgotten. How many strategy projects do not achieve their targets, simply because no stringent follow-up and follow-through process has been institutionalized. The implementation of the strategy becomes delayed, and new developments are not factored in. The fate of “strategies” is all too common: too fast can one get dominated by operational problems (dominance of system 3) and forgets the wider environment and future.

For Beer, it was hence crucial that organizations not only have one meeting up and then. The operations room should instead become an **institutionalized space**, where people could meet (even apart from crises) and exchange their views continuously: a place, where the future and self-reflection have a place in the organization. Strategy-making is a continuous process and not a one-time event. Circumstances continuously change, and organizations need to adapt without interruption. One must keep an eye continuously on the wider environment and the future.

A final comment on the character of the discussed “meeting of minds”: the interaction between systems 3 and 4 is a thinking and discussion process, we said. For this reason, meetings with a formal character are not particularly well suited, such as board meetings with strict agendas to discuss new issues and changes. One needs instead an atmosphere, where one can relax and where people can get closer to the matter as well as to one another. As a British national, Stafford Beer imagined a typical English club for this (1995c: 258). Whether organizations can nowadays implement such clubs feasibly is open for debate, but to have access to places that offer relaxation, seclusion, and quietness and where deep-going conversations without predefined agenda can emerge should become standard in organizations.

Summary

- System 4 is responsible for consolidating all the information related to the wider environment and future of the organization to a coherent picture (“focus”).
- Developing this picture cannot be delegated to individual units or persons but must be undertaken by all those personally who are responsible for system 4. It requires a common reflection and debating process.
- System 4 must ensure that the outside view and the knowledge about the inside of the organization match in variety. This requires that system 4 knows how system 3 is operating and how much innovation and strategic change the operational organization can digest.
- System 4 must overcome, in particular, the following three challenges:
 1. The invisibility and intangibility of the future.
 2. Its organizational fragmentation.
 3. The superiority of system 3 concerning the availability of information and power over resources.

- The dialogue between systems 3 and 4 is the key mechanism for the adaptation of an organization. For the varieties between systems 3 and 4 to exchange, an institutional space is needed that makes a continuous debate and reflection on the significant changes and necessary adaptation possible.

Questions for Reflection:

1. How much do the perceptions about the wider environment and future diverge in your organization?
2. Through what kind of processes and activities does your organization ensure that executives and employees exchange and let converge their perspectives on the organization’s future?
3. How is the future made visible and tangible in your organization? How well can employees experience the future?
4. How good is your organization in encouraging the exchange and debate of ideas, different perspectives, and opinions?
5. How does your organization ensure that systems 3 and 4 processes are in balance?
6. Are there institutional spaces, where the decision-makers in your organization can retreat to reflect essential questions about the future development of the organization in all tranquility and without stress?

References

- Beer, S. (1994). *Beyond dispute: The invention of team syntegrity*. Chichester, New York: Wiley.
- Beer, S. (1995a). *Diagnosing the system for organizations*. Chichester [West Sussex], New York: Wiley. (Figures 7, 35, 36 and 37 republished with permission of John Wiley and Sons Inc. and the permission conveyed through the Copyright Clearance Center, Inc.).
- Beer, S. (1995b). *Brain of the firm* (2nd ed.). Chichester, England, New York: Wiley.
- Beer, S. (1995c). *The heart of enterprise*. Chichester [England], New York: Wiley. (Figures 21 and 51 republished with permission of John Wiley and Sons Inc. and the permission conveyed through the Copyright Clearance Center, Inc.).
- Bort, J. (2016). A rare tour of Google’s ‘The Garage’ lab where employees can build anything. *Business Insider*. June 28.
- Drucker, P. F. (1992). New society of organizations. *Harvard Business Review*.
- Hoverstadt, P. (2008). *The fractal organization: Creating sustainable organizations with the Viable System Model*. Chichester, U.K., Hoboken, N.J.: Wiley.
- March, J. G. (1991). Exploration and exploitation in organizational learning. *Organization Science*, 2(1), 71–87.
- Malik, F. (2008). *Strategie des Managements komplexer Systeme: Ein Beitrag zur Management-Kybernetik evolutionärer Systeme* (10th ed.). Bern, Stuttgart, Wien: Haupt.
- Malik, F. (2011). *Strategie: Navigieren in der Komplexität der Neuen Welt*. Frankfurt a.M: Campus Verl.

-
- Pérez Ríos, J. (2012). *Design and diagnosis for sustainable organizations: The viable system method*. Heidelberg, New York: Springer.
- Schulz, T. (2014). Yeah, lasst es uns versuchen. *Der Spiegel*. December 15: 68–70.
- Schwaninger, M. (2006). *Intelligent organizations: Powerful models for systemic management; with 6 tables*. Heidelberg, New York: Springer.
- Stadler, C., Rajwani, T., & Karaba, F. (2014). Solutions to the exploration/exploitation dilemma: Networks as a new level of analysis. *International Journal of Management Reviews*, 16(2), 172–193.
- Turner, N., Swart, J., & Maylor, H. (2013). Mechanisms for managing ambidexterity: A review and research agenda. *International Journal of Management Reviews*, 15(3), 317–332.

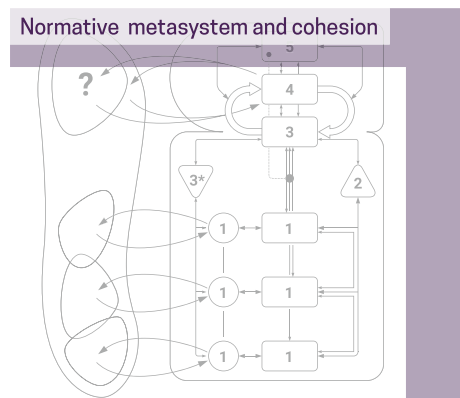
“Decisiveness and Closure”— The Normative Metasystem (Part 1)

Destiny is not a matter of chance; it is a matter of choice.
 (William Jennings Bryan, US-American orator and politician)

We now come to what could be considered the most potent system function in organizations: system 5, the normative part of the metasytem (see Fig. 8.1; Pérez Ríos 2012: 46). Its power can be immediately felt when one joins a new company and is confronted with rules, norms, principles, and decisions “carved in stone”. Every organization is guided, but also limited by these “fundamental guidelines”, which are the result of its system 5 processes.

For Jorgen V. Knudstrop, CEO of Lego, identity has been one of the key levers to turn around Lego, which was very close to bankruptcy in 2004. For him, it soon became clear, that a new identity was needed for Lego to grow again in a healthy way (Tweed 2013). For Google, innovation power also largely depends on the overarching objective and value that the company wants to create and that explains why it exists (Schulz 2014).

Fig. 8.1 The normative metasytem—contains adaptation from Beer (1995b: 136, Fig. 37)



System 5 is the last and ultimate authority in an organization and defines the identity, norms, and values of an organization. In doing so, it shapes the nature and future direction of the organization. It defines, what the organization is and what it is not, what is part of it and what not, where its boundaries lie and what its purpose is.

System 5 needs to accomplish the following four tasks in every organization, which we will discuss in greater detail in this and the next chapter:

1. **Deciding undecidable questions** and **developing guiding principles** for the organization (Sections. 8.1 and 8.2)
2. **Closing the organization** (Section 8.3)
3. **Balancing the metasystem** (Section 9.1) and
4. Maintaining **coherence** within the entire organization (Section 9.2)

8.1 Deciding the Undecidable: A Key Challenge for Organizations

Perhaps all these tasks sound very straightforward and easy to understand, especially nowadays when words like “values”, “identity” and so forth come easily across our lips. However, this easiness hinders us from fully grasping what system 5 does, what its true nature is, what its value contribution to the entire organization is, and finally what its specific challenges are. To make this more transparent is the task ahead of us. Only then, will we also understand, what it needs to make system 5 fully functioning.

8.1.1 Why Is a System 5 Needed?

To illuminate the necessity of system 5 and its functioning, let us briefly return to the situation described in the previous chapter: system 3 and 4 have the task of laying out, how the organization should adapt and develop. The need for an additional system function arises if these two system functions develop options that cannot be reconciled. Which option should be chosen—the one preferred by system 3 or the one by system 4? What is then required from the organization is a **decision**.

Most decisions can be made based on the information available to the organization or by using the decision criteria and models already developed and adopted earlier by the organization. In reality, however, this kind of decisions are already decided; system 3 and 4 only must go through all the information and criteria and apply them correctly to find the “right” decision. This is like solving an equation in high-school mathematics: tricky sometimes, but, in the end, just a matter of correctly applying known rules and procedures.

Real decision-making and the decisions with which system 5 is confronted is not anything like this. It means finding a way through a fundamentally unclear and foggy situation, where among the many available options no option clearly stands



Fig. 8.2 Real decisions are those, where the situation is ambivalent and one yet needs to develop the criteria to bring light into the matter (© Fotolia/stock.adobe.com; artist(s): mimadeo)

out and where all options have, one way or the other, significant drawbacks. **Real decisions are decisions that are fundamentally open** and where one has yet to develop guiding principles that help navigate through the unknown and uncharted territory ahead of the organization (Fig. 8.2).

The cybernetician Heinz von Förster once said very succinctly and provokingly that one can only decide the questions that are not decidable (Förster 1992: 14; Luhmann 2000: 132). These are the situations, where we can gather as much information as we would like, but where we are still not in a position to decide. These questions are the ones left to system 5 for a solution.¹ Since these decisions often touch fundamentals and create precedents, they also have significant implications for many other decisions and the future of the organization. Everyone knows that the decision will be a landmark for other decisions to come.

Neither system 3 nor 4 can decide this kind of questions for several reasons.

First, **system 3 and 4 cannot be neutral**, and this is a significant obstacle: a fundamental decision can only become sustainable and viable if the decision maker is not already leaning towards one option or is implicated in one of them. Decision-makers need to be neutral toward all options. If this were not the case, the decision to be made would become absurd: one would pretend to decide a question that has already been decided—a farce! This is also why, Ignatius of Loyola, founder

¹ Deciding is, of course, not a privilege of system 5; other systems functions “decide” as well (in particular system 2 and 3). What distinguishes system 5 decisions from other decisions is their nature: its decisions are a matter of fundamental direction. They define what the organization wants to be and what it does not want to become. As such system 5 decisions are the basis for the decisions made by all other systems functions, which execute their decision in the light of the system 5 decisions.

of the Jesuit order, made “indifference” toward all options the cornerstone and foundation of his famous 30-day retreats for people who need to make fundamental decisions in their lives (Loyola 1986). Neither the representatives from the internal perspective (system 3) nor those from the external and future perspective (system 4) can guarantee the necessary equidistance to all options. Another system function is hence needed that confers “objectivity”, “neutrality”, and “independence” to a decision. It must prove that the decision is made from the perspective of the entire organization and not from the parochial view of one of the system functions.

Second, this type of decisions becomes necessary, simply because system 3 and 4 do not have **sufficient information available** to decide them (otherwise they would have done it already). Neither the operational organization and its way to function, nor the outside world and future provide any decisive clues.

Such an open-ended situation requires processes and methodologies different from the ones of system 3 and 4. The decisions that system 3 and 4 cannot decide due to the lack of objective data or information force the organization to develop the **decision criteria from within**. There is no other source left to form these criteria than the organization itself. Practically, this means that the organization is called to reflect on what it **wants and what not**: “What is our mission and what do we want to be—and what not?” The organization must start a **dialog with itself** about its real intentions. It needs to sort out what is dear to it, and what is less important or even unwanted. System 5 type decisions need **self-reflection as their foundation**.

Decision-making is never just about building decision trees, the application of algorithms, or opinion polling. Decision-making is always about making clear to oneself, where one stands and what one wants long-term and fundamentally. We see this very well when, for instance, organizations use evaluation sheets, on which they evaluate the available options by awarding points to the options based on various criteria. In the end, they hope that the decision is made by just summing up the individual points. How often do we, however, experience situations, where at the end the option with the most points becomes rejected, because “this is not what we really wanted”?

This everyday experience shows us an essential characteristic of system 5 decision-making: a decision is never just the result of breaking down a question into evaluation criteria, awarding and then mechanically summing up points awarded to the individual options. It requires generating a **vantage point**, from which the various options can be evaluated in their entirety. It also necessitates the creation of **sufficient internal clarity** about one own’s ambitions, goals, and ends. Decision-making is first and foremost a self-reflective process with the objective to make up one’s mind. System 3 and 4 cannot develop this standpoint and self-clarity for the entire organization; they just cover specific aspects of the organization.

Third, what an organization also needs, before it decides, is the creation of a **higher-order perspective**,² which allows it to sort out all the options. To find this

² Beer (1995c: 262): Systems 5 becomes, in this sense, “metasystemic” to system 3 and 4.

sorting principle and vantage point is another critical process and challenge in the decision-making process. Sounds good, but again hides the enormous (intellectual) task that system 5 must accomplish, namely developing principles that can be applied to all decisions of the same type. This requires an enormous amount of abstraction and thinking. Neither system 3 and 4 are specialized in this task.

In the language of the VSM, the principles developed by system 5 must have **the capacity to process all the variety left unprocessed** by the other system functions. System 5 needs to “mop up” this residual variety by condensing it down to just a few parameters (Beer 1995b: 130). This is what, for instance, a Supreme Court (Fig. 8.3) is supposed to do: it attempts to boil down an issue to very few principles that can be applied to all aspects. “To put it (i.e., the variety) into a nutshell,...” —finding this nutshell is the daunting task of system 5.

This explains, by the way, why it is difficult to define “values” and “identities” for organizations. It does not merely suffice to make a wish list of what one wants to be: the fundamental values, principles, and identities must capture and process the reality (or in Ashby’s terms: variety) with which the organization is dealing. They must be meaningful with regard to all the issues, tasks, problems, and opportunities with which the organization is confronted. Otherwise, values, identities, and principles become hollow, meaningless, and will be fast forgotten or ignored—the typical fate of so many value or business mission statements that do not have the requisite variety in view of the organization’s reality.



Fig. 8.3 The US Supreme Court (© Fotolia/stock.adobe.com; artist(s): davidevion)

8.1.2 “Will This Definitely Be It...?”—The High Bars and Expectations for Every System 5 Decision

“Have you as well considered ...?” Every leader and manager knows this type of nerve cracking question from the audience after a decision has been announced. No doubt, the expectations regarding decisions are high: system 5 is expected to **consider all potentially relevant aspects of a question** during the decision-making process. To make appropriate decisions, system 5 needs to have it already seen “somehow all” (see Beer 1995b: 126). Whoever overlooks one essential detail, will see his or her decision soon being questioned. Hence, decision-makers are required to consider it “all”, however large this “all” of a decision might be. This necessity to “consider it all” can be felt specifically in the pain before making the actual decision.

Being required to “know it somehow all” is also the reason why people who take over system 5 functions have to demonstrate **experience**. We see this in daily life: employees always evaluate top decision-makers regarding their experience. They want to make sure that their decision-makers decide with a holistic perspective. Experience is thus a vital component of a well-functioning system 5.

Having it viewed “all” is necessary since system 5 decisions must **meet two formal requirements to add value to the organization**: first, the decisions must be generally applicable and second, they must be definitive in the temporal dimension. To put this into simpler terms: a decision, where one already knows beforehand that it will be revised will not function as a decision³ as no one will believe and follow it. This does not mean that decisions cannot be revised at a later moment given new circumstances and information; the point instead is that at the moment of the decision, the decision and its criteria must be of such a quality that the organization can believe in the **decision’s validity and definiteness**. This is the challenging situation, in which system 5 finds itself.

8.2 “Getting the Full Picture and a Clear Mind”—The Necessary Decision-Making Environment

Since the task is so intricate and yet at the same time exhaustive, system 5 needs to be organized appropriately. System 5 type decisions cannot be left to chance and individuals alone since the experience of one individual is often not sufficient. Organizations need to ensure that their decision-making processes are robust. System 5 decisions must be supported through at least three other specific mechanisms:

³ Following Luhmann (2000a: 142ff), we can say that the problem and paradox of decisions concerns the fact that they need to appear necessary but are inherently contingent and hence subject to revision.

1. Promotion of an open and heterarchical process.
2. Activation of the organization’s past and past decisions.
3. Stimulation of different perspectives and contrarian thinking.

Do you want to know more about these mechanisms? If so, then continue reading, otherwise go to Section 8.3

8.2.1 Top Decision-Making as an Open and Heterarchical Process

Decisions usually have the objective to “get it right”, and this means finding a solution that ensures the organization’s long-term viability. What are some of the key organizational instruments for a successfully operating system 5?

Instrument 1: Opening the circle of decision-makers

In autocratic systems, one individual claims to know “all” and have everything in his or her view. However, as we know, this claim is only partially possible: the variety, with which the organization is confronted is larger than the variety and information capacity of any individual. Autocratic systems rarely meet the demands of Ashby’s Law.⁴

Thus, viable systems must base their **decision-making processes on a broader basis** to achieve a holistic view on an issue. Here again, we see Ashby’s Law operating. To correspond to the vast variety of a decision, the number of individuals involved needs to be increased: more people means more perspectives and more knowledge—and hence, higher chances for a generally valid decision. Hans Urs von Balthasar (1972), one of the great Catholic theologians of the twentieth century, once said: “Truth is symphonic”—truth is not a solo piece. All must play together: in distinct roles but nevertheless at the same (hierarchical) level (Fig. 8.4).

⁴ This might be one of the reasons, why dictatorial systems tend to ascribe divine capabilities to their rulers. This is intended to mask any kind of limitations of this individual: like God, the dictator knows it all and has hence requisite *eigen*-variety.



Fig. 8.4 Truth is always multifaceted like the different voices in an orchestra (© Fotolia/stock.adobe.com; artist(s): Pavel Losevsky)

Stafford Beer often compared **system 5 with the human brain** (Fig. 8.5), where information is not processed hierarchically, but in parallel and through many, equally weighted and interconnected nodes (hence the concept of a “multi-node” in: Beer 1995a: 201–223). This notion is similar to another famous concept in organizational theory: the so-called “**heterarchy**” (Hedlund 1986; McCulloch 1945). To transform an organization into such a brain-like communication network, Stafford Beer developed the syntegegration method already mentioned above (Beer 1994).

Is this something new? Organizations know intuitively that complex and open decisions should be decided in a heterarchical manner. For this reason, decision-makers start intensely consulting with each other informally and across hierarchical levels long before significant decisions are taken. They implicitly breakdown the formal hierarchy to get a better and full picture. This big buzz of mutual consultation is nothing else than an attempt to build up this multi-node and to get a feeling of what the decision might be about, what everyone else thinks and where the answer to the issues to be decided

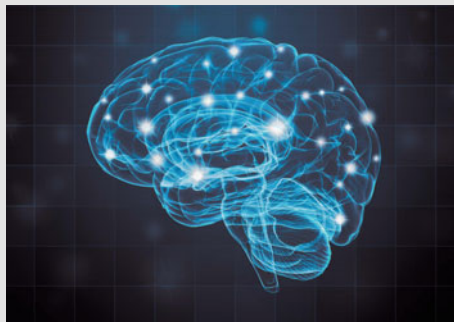


Fig. 8.5 Finding the right decisions requires connecting the different people together to a network like in a brain (© Fotolia/stock.adobe.com; artist(s): Ravil Sayfullin)

might lie. This is why in real life the decision-making process starts long before the official meetings where decisions are made, as experienced people know and who want to influence decisions.

The problem with these informal discussions and consultations prior to the official decision-making process is, however, their informal character, which risks excluding people who might have valuable information and which favors coalition building (see also Section 4.2.4). The decision-making process might then become dominated by a few. So, it is better to organize this joint reflection process as transparently as possible.

To this end, methods and formats have been developed such as world cafés or Stafford Beer’s syntegration method. These methods are very suitable for specific ad-hoc decisions. Organizations, however, need to go further; they need to institutionalize these methods, by creating spaces that allow discussing issues openly on an ongoing basis. This is why Stafford Beer invented the Operations room. In democracies, we find such multi-nodes already institutionalized in the form of parliaments.

Instrument 2: Openness of the discussion

We compared organizations to a symphony orchestra with its different instruments. But in contrast to an orchestra, the “piece” that system 5 should play is not yet known. “What is the decision all about?” This question has not yet been answered. Organizations are like people standing too close to a stained-glass window. They can see only the individual colored glass pieces (Fig. 8.6), but not the entire window. Often, we make the experience that the

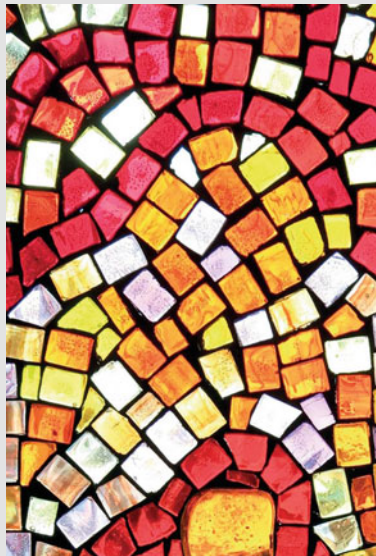


Fig. 8.6 What is the bigger picture behind all the pieces of information? (© Fotolia/stock.adobe.com; artist(s): farbformat)

question tabled at the beginning was not the relevant question. The bigger picture, once generated, might point us later to a different question and, hence, solution.

Finding the piece and melody (or the real question to decide) means that one needs to listen and that one should not structure the decision-making process too much in advance. Every predefined agenda could already imply beforehand that one knows what needs to be known and decided. “We should have an **open discussion!**” one often hears in such situations. Quite right, a too strictly defined agenda is never neutral in a fundamental decision-making process! No one knows beforehand, what the real issues are and how these should be weighed against each other (Beer 1995a: 209).

Instead, the whole truth needs yet to emerge through debating the issues. Only then can one know what the real issues are and who can contribute what kind of knowledge. Do workshops not often advance best and reach new levels of understanding if one lets the discussion sometimes just flow? Often the “real” truth emerges only through a process that leaves **ample room open to define and redefine the structure of the discussion.**

Thus, the “organization” of this system 5-process can and should limit itself only to specific formal procedures. It should only ensure that the participants engage as much as possible with each other so that the knowledge buried in the peoples’ minds can emerge to the surface and can start flowing around between participants. Any super- or subordination of topics or individuals should be avoided because it presupposes knowing beforehand who knows what. The participants themselves should decide as much as possible what is relevant and what not.

System 5 only works well if organizations are sufficiently patient and take a step back from preset patterns and explanations. They need to give themselves time to understand better what all the “noise” is about and what the deep-seating theme and patterns are behind the issues to decide. This process by which the patterns and fundamental principles emerge is the process that contributes to the creation of the higher order perspective. Truth means, according to the famous German philosopher Martin Heidegger (2006: 218), to take away the veil from what is visible on the surface and seems to be obvious. The truth is seldom what is obvious. The “obvious” might often even be dangerous and treacherous; it might hide what is truly the case.

Taking away the veil of the obvious is hard and unveiling the truth, requires two critical processes from all participants: first, careful listening to and second, meditating upon what has been said. For this, system 5 must create the adequate culture and values.

Instrument 3: balancing hierarchy and heterarchy

Creating a heterarchical and open discussion atmosphere, however, creates a paradoxical and tricky situation for hierarchically structured organizations:

how can one speak up freely, if one is subordinated to someone else and must fear punishment for a dissenting opinion? Every organization experiences this problem and the challenge to balance hierarchy and heterarchy.

This dilemma requires system 5 to develop and establish specific **rules of the game**, such as confidentiality, anonymity to outsiders, and non-prosecution of dissenting opinions. The practice of “closed doors” is also used as an instrument to breakdown hierarchical barriers to speak openly and freely independently of rank, sex, age, etc. Even the Catholic church, perhaps one of the most hierarchical organizations in this world, leaves the election of the future Pope to a collegium of cardinals and their free discussion and election process. However, it does so behind closed doors, in the so-called “conclave”. Closed doors such as with the conclave have the paradoxical effect of allowing the participants to speak freely. The free exchange of information is necessary, to get a glimpse of what the decision must clarify and decide.

These rules of confidentiality are a precondition that organizations can live the paradoxical situation to operate both hierarchically and heterarchically. Often hierarchical and “flat” organizations are brought into opposition to each other in management literature. “One can only have hierarchical or flat organizations,” is what is often suggested. However, if one looks closely enough into the real functioning of organizations, it seems that rather both are needed. Organizations cannot choose between one of them but must live with both: no organization has survived long-term, so it seems, that was either entirely hierarchical-totalitarian or wholly open and egalitarian.

It is this **interplay and balancing between hierarchy and heterarchy** that is the feature of functioning and viable organizations. Everyone in the organization must know when which mode applies and what kind of behavior is required. It must be possible that after a closed-door meeting a heterarchical relationship can change to a hierarchical between an executive and his or her employee, and vice versa without losing one’s face.

8.2.2 “Make no Mistake Twice!”—The Past as a Risk-Free Laboratory for Today’s Decision

Another essential source for organizations is not only the individuals and their individual experiences but also the organization’s history. We often consider history as something almost irrelevant and obsolete, but history has one distinctive advantage: it already contains **the future of past decisions**. Through history, one already knows the consequences of past decisions. History hence offers an excellent opportunity to understand better and simulate the possible consequences of a decision. There are always somewhere precedents in the organization’s history that show system 5 what the effects of a decision might

be. The history of the organization is a **risk-free laboratory**, where it can test out its decisions and refine or develop decision criteria.

If we watch decision-making processes in organizations closely, we see that organizations actually “re-create” history in decision-making moments. History generally remains dormant throughout the daily business. It only becomes activated with difficult decisions, when we try to remember past events and decisions for current decisions: “do not you remember, we already tried that out?!” Organizations reactivate and retell (and sometimes reinvent) their respective history to find clues on how to decide the future.

The reactivation and consultation of history have another additional advantage: they increase the **continuity and coherence with other decisions**, which is another significant concern for system 5. It does not want to contradict itself, which would endanger its credibility. Every decision needs to be aligned with other decisions. Otherwise, conflicts will arise, and the faith into the decision-making capabilities and coherence of the organization will diminish. Consulting the history increases the likelihood that a decision is coherent and has not overlooked essential aspects.

It, therefore, comes to no surprise that organizations sometimes put significant effort into maintaining their institutional memory. One could argue that this is a waste of resources, but in light of the above discussed, we see that the organization’s history and experiences are a valuable source of organizational stability. Therefore, system 5 is often the seat and custodian of the organization’s memory—it needs it for its functioning.

8.2.3 Right Decisions Need Many but also Different Perspectives

For Peter Drucker (1993: 470ff), the quality of a decision does not solely depend on whether one has found a right answer. Instead, one must ensure that the question asked was the right one. Only once one has understood what **the right question** is, one can make the right decision.

However, how does one find the right question? The only way available seems to be to consider the question to be decided from different angles and to question even this question. Only then can one get a better and deeper understanding of what the question should be. Are not good and fruitful discussions those where one finally starts with a comment such as: “Is not the real question that ...?”. Only after reaching this point, one leaves the surface and starts diving deep into the heart of a matter. A good decision-making process is one, where one does not finish with the same question, with which it was started.

For this to be achieved, the decision-making process needs an essential ingredient that we have already mentioned earlier: **different perspectives**,

because only different perspectives force us to go more in-depth (*ibid.*, 78f). Therefore, Peter Drucker insisted on the point that decision-making processes should not start with the collection of facts, but, counterintuitively, with opinions (*ibid.*, 471). Why is that so? Should not we start with “facts”?

The reason is simple: **opinions** are ultimately nothing else than different perspectives. They behave like different (cognitive) light beams that shed light on the various aspects of a question. Through opinions, a question gets its contours, and one can find out what needs to be questioned. Only through opinions can we know which facts we must look for and what we need to validate or falsify.

Also, opinions are the sparks that kindle a discussion and without which a discussion cannot start and be kept in motion. Nothing is more boring than the account of facts. What should one then discuss? Only through opinions, does a topic become dynamic and exciting. Therefore, whoever has no opinion should not participate in a discussion. He or she can shed no light on the matter, which is why such persons will not be invited to further discussions, following the dictum: “if two share the same opinion, then there is one too many of us.”

We now touch a problem that we have not yet addressed, and that is very important: a sufficient number of participants (see Section 8.2.1) and the organization’s history (see Section 8.2.2) can bring light into what a decision is all about, we said. However, they are no guarantee that all relevant issues will be become unearthed and different perspectives will be generated. On the contrary: participants in a decision-making process never enter the process neutrally, they are always already influenced by the identity and history of the organization. The decision-making group as such also promotes conformity among participants (see groupthink effect).

Equally, the history of an organization as a source for system 5 might not entail sufficiently different perspectives for a simple reason: the present organization is mainly the result of past decisions and thus probably very similar to its past. Consulting too much history might instead reinforce conventional thinking and hinder us in adopting new perspectives. History is a valuable source, but also a mental trap.

To generate different perspectives is thus not as easy for organizations as it might seem—and yet still very vital. How difficult it is to generate different perspectives, we can easily observe in reality: discussions in organizations often become repetitive and get stuck in the same thinking and argumentation patterns. Arguments are only repeated, and organizations go around in circles, trying hard, but often failing to escape their mental patterns. Paradoxically, they are often aware of this happening, but cannot find a way to evade this vicious circle.

This observation leads us to one important conclusion: **a functioning system 5 must cultivate sources of different perspectives and opinions actively.** This it can achieve, for instance, by...

1. ...exposing its decision-makers conscientiously and actively to **new and different experiences** in the world outside of their organization and lifeworld,
2. ...promoting a **debating culture**, in which dissent and the production of different viewpoints are promoted and finally,
3. ...**integrating the outside world into the organization** (e.g., external experts, stakeholders, opinion leaders).

Presumably, we have yet a long way to go in this direction, but cultivating sources of different thinking is and will be vital in a fast-changing world. A world that is becoming increasingly diverse requires an organization to keep up its internal diversity to understand the world. This is a consequence of Ashby's Law. This explains, why companies increasingly monitor whether they have sufficient diversity especially among their executives. Internal diversity is not a way to the chaos that needs to be avoided but might create the competitive advantage necessary in today's world. Diversity is a valuable resource and input for organizations!

8.3 The Courage to Close the Organization

The heterarchical organization of system 5 and the different perspectives as discussed in the previous chapter are not an end in themselves. The objective of diversity is to obtain better-informed decisions, but what is needed, in the end, is a decision. Diversity must not become a barrier to deciding an issue. It is fascinating to observe that employees are sometimes ahead of their superiors and get enervated if their leaders and managers ponder a question for too long and are indecisive. “Just tell us your decision, no matter what it is, but please make a decision”, is often heard in such instances.

System 5 decisions must accomplish one vital function: **they must close an issue** so that the organization can continue its operation based on the decision made.⁵ System 5 is not just thinking and reflecting; it also needs to close an organization and help it to make the next step. It must not shy away from a decision. Otherwise, it will waste an

⁵ For Luhmann, undecidable issues and the capacity to decide undecidable issues are even the precondition for evolution. For him, evolution is not a logical process based on observation but on contradictions. Contradictions open up opportunities to change the way in which social systems have operated so far (1987: 10f. 492ff).

organization's time and resources. The mission "We are a premium quality producer" has the disadvantage that it excludes many other options and business models and thus creates risk. However, it also allows the organization to move on. Who has too many options risks implementing none. One must decide for one option so that the present can become past and the future can arrive. Without agreed principles and a business mission an organization becomes lamed, as Peter Drucker once stated (2006: 64).

This also implies that system 5's decisions should never leave issues intentionally open. System 5 needs to avoid any false and coward compromise that will reemerge later and paralyze the organization for an even longer period. It also diminishes the organization's faith in its decision-making capabilities. System 5 **hence needs to have sufficient courage and responsibility to decide firmly and definitively what divides the organization** (s. also Drucker 1993: 79).

Do you want to know why organizations need a "boss" and what its systemic function is? If so, then continue reading here, otherwise, go to Section 8.4.

The necessity to achieve closure in an organization helps us to understand why "bosses" are needed. It is interesting to observe that despite all attempts to establish flat hierarchies and teamwork, the "boss-function" has not been eradicated from organizations—but why?

To have a "boss" results from the necessity to close an organization. The boss-function is a formal principle that helps to achieve closure even in situations, where this is not possible. Every organization faces in its lifetime questions upon which it cannot reach a consensus on what to do. Neither a vast number of participants, nor the consultation of history, nor the confrontation of different perspectives can guarantee that a decision is found. In such situations, the organization remains divided and hence paralyzed. It cannot move on.

This type of questions, therefore, cannot be solved on factual arguments and facts, but rather needs to be resolved through a formal decision-making procedure. Several options exist such as voting based either on different levels of majority (simple majority, 2/3 majority, unanimity) or on specific qualitative characteristics.⁶ All these mechanisms have one purpose: namely to lead to a decision and to avoid a deadlock. To avoid a stillstand, an organization needs a final instance; it needs to stop the decision process somehow and avoid the possibility of appealing a decision too often. Otherwise, the organization would enter a *regress ad infinitum*.

⁶ Specific members might have special rights such as a veto or a vote with greater weight.

The Catholic Church has coined the phrase: “Rome has spoken, the matter is finished.” One may dislike this, but, in the end, a decision is always better than no decision. The “boss” is one of these formal mechanisms to close an organization: if no decision can be reached, the boss is the last resort for an organization to come to a decision and to avoid the fate of a lame duck.

8.4 Who Is “System 5”?

One of the most puzzling questions is: who is system 5? According to the systemic approach of the VSM, system 5 is whoever exercises a system 5 activity, that is, someone who participates in a decision that concerns the fundamental orientation, identity, values, principles, and purpose of an organization. Typically, officially legitimized bodies such as supervisory boards, general assemblies or specialized committees are responsible for this kind of issues. However, one must be aware of the fact that the circle of individuals who exercise a system 5 function is often wider than the composition of these official institutions would suggest.

Often system 5 can be *de facto* exercised by someone else in the organization, and it is not always the individual(s) at the top of the organizational chart (Beer 1984: 16f). It could be for instance...

- ... the assistants to the boss who decide in the name of the boss, just merely because they are the gatekeeper to the boss’s ear.
- ... middle-rank managers who are experts in specific aspects and who decide *de facto* for the whole organization. Their “recommendation” to the management board is, in reality, already the decision to be followed, which will not be questioned by anyone in the organization.
- ... the unions or the work councils that decide what is going on in the company.
- ... the environment, e.g., the customers of a cooperative, the parents in a school, or powerful customers and customer lobby groups.
- ... and finally, someone external such as consultants or the spouses of executives.

All of the above can have the last word in a matter, not because of the organization’s constitution, but *de facto*. This means that the system 5 function can shift through the organization in its scope, composition, and area of responsibility (Beer 1995a: 232). These *de facto* systems 5, although encountered often in real life, can be problematic: since they first reduce the internal transparency and accountability within the organization and secondly, it is not certain that they have the requisite *eigen-variety*.

The key determinant for the viability of an organization is that whoever finally decides a question for the organization, must have the requisite *eigen*-variety for this decision. Whoever exercises a system 5 function must fully understand, what the dispute between system 3 and 4 is about and how the viability and the purpose of the entire (!) organization can be best protected long-term. Whether one of those *de facto* system 5 representatives mentioned above has this understanding and the requisite variety to deal with the system 5 type decisions is the key question. An important result of any organizational diagnosis is to understand who exercises system 5 in reality and whether this system 5 is compliant with Ashby’s Law.

Who should then be involved in system 5 and for what issues? If we look into the practices of organizations, we see that the involvement and composition of system 5 can vary depending on the factual aspects, the urgency, and the social demands. Different issues require different competencies and individuals. In democracies, parliaments with some hundred MPs regularly convene throughout a year; to discuss more fundamental questions the entire population, however, is required to express its opinions such as in elections or referenda. If a crisis looms governments or heads of states get special rights conferred to make quick decisions possible. In these cases, shorter and quicker decision-making cycles that increase a country’s agility and responsiveness are needed.

For organizations, we see the same kind of differentiation: they can range from monthly or quarterly meetings of the management boards to annual conventions of all shareholders or employees. The criterion for the composition and temporal structure of system 5 must follow Ashby’s Law: System 5 should be constituted by the individuals who help the organization generate the requisite *eigen*-variety to solve the question to be decided within the given time frame.

8.5 What Are the Manifestations of System 5 Decisions?

The manifestations of system 5 can be manifold depending on their purpose and context: if the business model needs to be (re)defined, business policies and principles that define the scope of possible strategic options are typical system 5 manifestations. If human behavior is concerned then norms, ethical rules, laws, and codes of conduct are the corresponding system 5-decisions. If one must decide between different objectives, then values are the corresponding system 5 manifestations. Identity is finally the result of all the fundamental boundaries drawn and preferences by system 5 (see as well Schwaninger 2006, 150ff).

System 5 decisions can be found in **written documents**, but also in **uncodified rules** that one must learn as a newcomer. Principles and identities can also be expressed through **material objects**, such as in the architecture and the interior decoration of office buildings, symbols, or fashion guidelines (a tie is often more than just a decorative piece of cloth, but an expression of identity). From these material objects, we can extract the true spirit of an organization much more directly than from many official documents.

It is no surprise that organizations often use the architecture, the interior design of their buildings or the public appearance of their organization to change their corporate identity. For example, the freedom party in Germany changed the official party color to signal and instill a new identity (JBE 2014). In private, we do the same thing: when we want to reinvent ourselves, we also buy new clothes or redecorate our apartment. These material changes often have a significant impact on our behavior and decision-making.

In all these manifestations of system 5 decisions, one should not forget that a **large part of system 5’s “output” remains undocumented**. People with significant working experience distinguish themselves from beginners that when they join a new organization immediately search for clues as to how the company is working “in reality” as opposed to “on paper”. What are the “GOs” and what are the “No-GOs”? What is essential and relevant to the company and what not? What does the company indeed want and what is its real purpose? Many principles that are written on paper exist only on the paper on which they are written. In reality, the organization is often governed by other principles and values ... and these are the ones that count and need to be found out.

8.6 Better to Have Examples Than Abstract Principles

Decisions need to be generally valid and definitive, as we said earlier. At the same time, we know that the future will be different. How can organizations secure the definitiveness of decisions despite all changing circumstances? A decision should not only apply to a specific case, but to as many different contexts as possible. What is thus required, is a transfer function between a decision and related subsequent decisions. This brings us to another class of system 5 manifestations:

Organizations can use two main methods: first, they could write down manuals on how to understand and apply a decision or second, they gather a collection of examples and typical cases. Whereas the first method is applied especially in the legal area, it is more difficult for organizations to use it. Written documentation costs too much time. Who wants and has the time to read manuals on how to apply correctly a decision that was once taken, e.g., guidelines, rules or procedures, if one does not have enough time?

However, principles without interpretation do not work either and general principles as we find them, especially in visionary statements, are too general and vague, such as “we are customer focused, and we act socially responsible”. What do these sentences mean in this or that concrete situation? one wonders. These sentences remain abstract and without life. Only their concrete application seems to generate an understanding in employees, how such statements should be understood and what their purpose is.

Concrete situations, experiences, and examples of how others reacted and behaved seem to illustrate better, what route to take. Comparing behaviors in different situations also makes it easier to discern the intention of a principle and how an organization lives it in reality. In examples, an organization reveals its real intention and how serious and credible it is with regard to its principles. Examples not only express the principles but also the will and decisiveness of system 5. And of course, examples are also easier to understand than manuals because they are short and concrete.

Examples and anecdotes appear in no description of an organization, but they are a crucial element since they communicate very efficiently and effectively fundamental decisions on norms and values. Perhaps, giving an example is one of the most important manifestations and instruments of system 5 at all. Often people overlook how much organizations are shaped by examples, anecdotes, and stories told in the organization. Probably there is no better way to transform an organization than by creating new examples that manifest what the new values and the new identity are in a more credible and convincing way. Hence, it is better perhaps to have role models and examples to which people can look up than visionary statements and moral codes hanging on the wall if one wants to change an organization's identity.

Summary

- System 5 becomes necessary for deciding questions that neither system 3 nor 4 can decide (i.e., the “undecidable” questions). Thus, one core process of system 5 is to develop the decision criteria that allow evaluating and weighing the options brought forward by system 3 and 4.
- System 5 also becomes necessary to confer “objectivity” and “neutrality” to fundamental decisions within an organization.
- System 5 decisions need to be generally valid and temporally definitive. Only then, can they close the organization. To this end, system 5 and all of the people involved in it must try to view all aspects relevant to a decision (“viewing it all”).
- System 5 can obtain such a comprehensive and holistic perspective through three mechanisms:
 1. Integrating all individuals who have the necessary know-how and connecting them through a heterarchically organized process
 2. Consulting past decisions and the history of an organization
 3. Promoting and including different perspectives in the decision-making process
- System 5 must ensure that through its decisions the organization becomes closed and can continue operating. System 5 should not leave any issues intentionally open, nor should it attempt to withdraw from a decision or resort to a false compromise.

- The manifestations of system 5 can be manifold: written documents, but also uncodified rules, norms, and principles of behavior or even material objects.
- Experiences, stories, and examples of behavior are also very important manifestations of system 5 decisions and function as reference points for the culture, behavior, and decisions in the entire organization.

Questions for Reflection:

1. How clearly are the purpose, identity, basic values, and principles expressed in your organization?
2. How well do these principles and values reflect the variety that the organization needs to process?
3. What is the quality of the fundamental decisions taken in your organization regarding:
 - Their objectivity and neutrality
 - Their general validity and definitiveness and
 - Their ability to close debated issues?
4. What could be the reasons that decisions in your organizations are deficient in one in the before mentioned three criteria?
5. How good is your organization in cultivating diversity and different perspectives and experiences?
6. How well does your organization cope with being hierarchical as well as heterarchical? How well can it change between both modes?
7. How well do your *de facto* representatives of system 5 possess requisite *eigen*-variety for the fundamental decisions in your organization?
8. How much does your organization understand that the examples set and the stories told in an organization are the conveyors of the organization’s identity, principles, and values?

References

- Beer, S. (1984). The viable system model: Its provenance, development, methodology and pathology. *Journal of the Operational Research Society*, 35(1), 7–25.
- Beer, S. (1994). *Beyond dispute: The invention of team syntegrity*. Chichester, New York: Wiley.
- Beer, S. (1995a). *Brain of the firm* (2nd ed.). Chichester, New York: Wiley.
- Beer, S. (1995b). *Diagnosing the system for organizations*. Chichester [West Sussex], New York: Wiley. (Figures 7, 35, 36 and 37 republished with permission of John Wiley and Sons Inc. and the permission conveyed through the Copyright Clearance Center, Inc.).

- Beer, S. (1995c). *The heart of enterprise*. Chichester [England], New York: Wiley. (Figures 21 and 51 republished with permission of John Wiley and Sons Inc. and the permission conveyed through the Copyright Clearance Center, Inc.).
- Drucker, P. F. (1993). *Management: Tasks, responsibilities, practices* (1st ed.). New York: HarperBusiness.
- Drucker, P. F. (2006). *The practice of management* (1st ed.). New York: Collins.
- Förster, Hv. (1992). Ethics and second-order cybernetics. *Cybernetics and Human Knowing*, 1(1), 9–20.
- Hedlund, G. (1986). The hypermodern MNC—A heterarchy? *Human Resource Management*, 25(1), 9–35.
- Heidegger, M. (2006). *Sein und Zeit* (19th ed.). Tübingen: Max Niemeyer.
- JBE. (2014). Neue Parteifarben für die FDP: Optische Täuschung. *Der Spiegel*. December 20.
- Loyola, I. (1986). *Spiritual exercises of St. Ignatius: Based on studies in the language of the autograph* (L. J. Puhl, Trans.). Chicago: Loyola University Press.
- Luhmann, N. (1987). *Soziale Systeme: Grundriss einer allgemeinen Theorie* (1st ed.). Frankfurt am Main: Suhrkamp.
- Luhmann, N. (2000). *Organisation und Entscheidung*. Opladen [u.a.]: Westdt. Verl.
- McCulloch, W. (1945). A heterarchy of values determined by the topology of nervous nets. *The Bulletin of Mathematical Biophysics*, 7(2), 89–93.
- Pérez Ríos, J. (2012). *Design and diagnosis for sustainable organizations: The viable system method*. Heidelberg, New York: Springer-Verlag.
- Schulz, T. (2014). Yeah, lasst es uns versuchen. *Der Spiegel*. December 15: 68–70.
- Schwabinger, M. (2006). *Intelligent organizations: Powerful models for systemic management; with 6 tables*. Berlin, Heidelberg, New York: Springer.
- Tweed, D. (2013). *Brick by Brick: Inside Lego*. Documentary. Bloomberg. April 17.
- von Balthasar, H. U. (1972). *Die Wahrheit ist symphonisch: Aspekte des christlichen Pluralismus*. Einsiedeln: Johannes-Verlag [Auslfg.: Benziger, Einsiedeln].

“Facing Responsibility”— The Normative Metasystem (Part 2)

We are made wise not by the recollection of our past, but by the responsibility for our future.

(George Bernard Shaw, Irish writer)

In the last chapter, we mainly focused on the internal functioning of system 5, namely, the decisions regarding essential issues. Now, we turn our attention to its **function for the organization**, which, apart from closing the organization, also consists of taking care of the **organization’s internal coherence**. System 5 must ensure that the fundamental equilibria within the organization are maintained: first, within the metasystem, but second also between the metasystem and the operational organization.

System 5 has **the task not only to decide but also to mediate and conciliate**. Wherein does this mediation function consist and what are the tensions and dilemma that arise for system 5? This will be the guiding question for this chapter.

9.1 Balancing the Strategic and Normative Metasystem

System 5 as the ultimate decision-making function within the organization is, in the end, responsible for the interactions and internal “climate” in the metasystem: it must ensure that the participating system functions and their perspectives are evenly balanced out during the discussion process, which includes itself. What does this mean in detail?

9.1.1 “Give Objectivity and Truth a Chance”— The Necessary Balance Between System 3 and 4

Let us begin with a fundamental challenge for system 5 that we have already touched upon earlier: system 5 receives information typically only from system 3 and 4. Hence, it depends on both functions, and if one of the other system functions

dominates the discourse, it becomes difficult for system 5 to make an objective decision. System 5 must react to this challenge and must balance out system 3 and 4. It must make sure that both system functions can equally make their case, have equal access to information and have the same possibility to present it.

We can observe this challenge of getting balanced information during elections: the voter as system 5 in a democracy depends on the information provided by the political parties. If one of the parties dominates the information flow to voters (e.g., through the media), then it becomes difficult for voters to make an objective decision. Some voters will try to counterbalance this deficit, but for the broad majority, this will be too burdensome. Hence, not the candidate who is factually right wins in an election, but the candidate who dominates the information flow.

The board of directors as the system 5 in a company decides mostly on the information provided by the management. They just do not have the time nor access to gather all the information by themselves. It belongs to the well-known (mal) practices that the management “tunes” the information and data presented to the board. This practice can facilitate and speed up the decision-making process but bears the risk that the board of directors does not obtain a full account of the situation and cannot come to an objective conclusion.

Experienced directors know about this danger and, hence, check, whether the presented information reflects all relevant knowledge and opinions in an organization. The typical question: “what does Mr./Mrs., our expert on..., say to this point ...?” is precisely the attempt by directors to get a view on how reliable the information collection process has been and whether the presented situation is an accurate account of the real situation.

Organizations lose much adaptability and effectiveness, if issues are not discussed openly. The adjustment process of the various aspects and descriptions of what is the “real situation” that the organization is facing then cannot occur. Hiding issues prevents the organization from operating according to Ashby’s Law. System 5 must prevent this from happening. It must ensure that an issue is and can be discussed until the heart of the matter is reached. System 5 needs to be conscious enough to know that if the organization does not want to face the truth and prevents truth from emerging, it will face the truth as the “daughter of time” at a later point even more dramatically and severely, as many corporate scandals show. Ashby’s Law will prevail, and hidden imbalances in the varieties will eventually emerge.

From this perspective, we now can define a key function of the board of directors with greater precision: the board is responsible that the **truth can emerge** as much as possible. The board is the organization’s last chance to face the truth before the actual decision is made. For this, experienced directors are feared: they bring light to issues, of which the organization prefers instead not to be made aware. Unveiling the truth is painful and contains its own barrier. To overcome this inherent obstacle, system 5 needs to ensure a positive, open, and mutually appreciating debating climate that facilitates the emergence of truth.¹

¹ Explicitly in the sense of Habermas (1995).

Finally, objectivity and neutrality are not only necessary for the collection of information and preparation of decisions; they are equally important for a decision to be accepted by the rest of the organization. If objectivity and neutrality are missing, then a shady aftertaste remains. This is the case if for instance issues are presented to decision-making committees, where the decisions have already been made. Then the organization quite rightly suspects that perhaps not all of the relevant aspects have been tabled or considered. This kind of decision then not only fails to decide a matter, but also deepens the preexisting divisions within the organization. The decision that should close everything becomes, in the end, ineffective.

9.1.2 “I Know It Better”—The Temptation of System 5

However, not only system 3 and 4 need to be kept in balance; system 5 also must make sure that it is in balance with the two other metasystemic functions. One big temptation of system 5 is to “know it better” than system 3 and 4 and to dominate both. In this case, system 5 is replacing system 3 and 4, which happens in ideological or dogmatic decisions.

System 5 should not try to dominate the other systems functions, let alone for lack of information. System 5 does not have, by far, as much information available as system 3 and 4. For system 5 to start collecting the information that system 3 and 4 have already gathered would render an organization inefficient. Boards of directors typically want to rely quite rightly on the data and information presented by management. For them it is inefficient if they are forced to collect information by themselves: this is what management is for, after all.

Also, the highly complex relationship between system 3 and 4 and the difficulty to achieve a balance, make it necessary for system 5 to keep its intervention as small as possible. One has just to imagine strategic change processes, where it is already difficult to find the right course from a factual perspective, and where often opposing demands from different time horizons must be mediated (short term versus long-term considerations). If in such complex decision situations an issue becomes too quickly a matter of ideology, beliefs and principles, then an organization easily risks overlooking essential aspects and might lose its agility and pragmatism. One should thus try not to view issues from too much a fundamental and ideological perspective.

In such situations, it is much more beneficial for an organization, if a decision could emerge as much as possible directly from the debate between system 3 and 4, i.e., between those who favor the current status and those who want to change—this would be the ideal case. Perhaps, sometimes an explicit intervention and decision by system 5 would be required, but overall, system 5 should act in a very restrained way.

Stafford Beer thus saw the primary task of system 5 in this process rather as one of **monitoring, gently guiding, and stimulating the debate between system 3 and 4** than in intervening into it directly. An intervention by system 5 that comes too early can hinder, if not stop the mutual adjustment process between system 3 and 4. Too early decisions based just on fundamentals and principles might leave many factual aspects and issues unconsidered and open, which will cause even

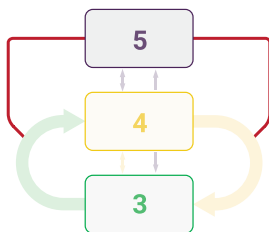


Fig. 9.1 The monitoring channel of system 5 (red) (adapted from Beer (1995b: 129, Fig. 35))

greater discussions and conflicts at a later point. A decision that results directly from the debate between system 3 and 4 ensures that their varieties are truly adjusted (Espejo 1989: 86f).

Stafford Beer (1995b: 129) expressed this aspect graphically by adding a channel between system 5 and the interaction channel between system 3 and 4: the **monitoring channel** (see red channel in Fig. 9.1). He wanted to convey the message that monitoring, stimulation, and advising should remain the primary modes of system 5. The open, honest, and profound debate is the center of the metasystem, and it should not be interrupted unnecessarily or broken down by the central command channel, which system 5 could also use. The central command channel should be only the last resort for system 5 to close the organization.

For this reason, the fundamental decisions by system 5 should have less of the character of commands, but rather of guidelines that assist system 3 and 4 to refocus, reorder, and hence to rejuvenate the debate. The guidelines and new framework provided by system 5 should enable system 3 and 4 to see their points of conflict from **a new perspective** and to reevaluate their priorities (“what is really essential in this question?”). System 5 exercises, viewed from this perspective and as already stated earlier, rather a metasystemic function to system 3 and 4 (Beer 1995c: 262)—a sort of metasystem within the metasystem.

The graphical depiction of the monitoring channel similar to parentheses shows us another aspect: **system 5 needs to hold system 3 and 4 together**. The discussions between system 3 and 4 are naturally very intense. They go to the heart of the matter, and this is the place, where opposing views clash with each other. Consequently, substantial centrifugal forces develop between system 3 and 4. In this situation, it is system 5’s responsibility to ensure that system 3 and 4 continue to talk to each other and do not quit the debate prematurely. Otherwise, a divided metasystem would result.

System 5 thus needs to take care that its acts and decisions, and more precisely the logic entailed in its decisions, function as **a bridge between the opposing views of system 3 and 4**.² System 5 needs to ensure that system 3 and 4 stay

² Considered from this perspective, it is intriguing that the Pope in the Catholic church is called “pontifex maximus”, the supreme bridge builder. Originally, this meant the bridge between this world and the divine world. But, who can build a bridge to the divine sphere, without unifying this world, and thus without building bridges in this world?

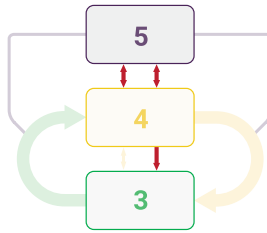


Fig. 9.2 “Just in case ...”: system 5 has its own central command channel (in red), if no consensus can be reached (adapted from Beer (1995b: 136, Fig. 37))

connected and do not become divided through its interventions and decisions. This implies that its decisions must incorporate, respond and reflect the concerns of system 3 and 4 adequately. It needs to process the variety that is left unprocessed by system 3 and 4.³

However, system 5 should not become too pleasing and “cuddly”. The VSM is clear in that regard: system 5 should not just be a sounding board or council of elderlies. It needs to have the capacity and power to decide in the end if no decision can be reached and the organization runs the danger of paralysis. Apart from the monitoring and balancing channel, system 5 thus needs to have a central decision and command channel to stop a stalemate situation.

The central channel differentiates it from pure sounding boards that on the one hand are a valuable instrument, but which on the other hand no one takes seriously due to a lacking enforcement authority. The possibility and threat to use the central command channel (Fig. 9.2) if needed, can then work as a catalyst for system 3 and 4 to retry reaching a consensus.

9.2 The Algedonic Channel—The “Thermometer” for the Organization’s Cohesion

System 5 obtains its information on the status of the operational organization through system 3. However, does this information reflect the actual situation? Does a CEO get all relevant information reported from the business unit leaders or a board of directors from the management? This can be a technical problem in the sense of how filters should be calibrated (“what should and must our superiors know?”), but it also can be related to diverging interests and motives between

³ If this does not happen, the decisions by system 5 will be considered as an unworldly or ivory-tower. We can observe this, when appeals are made to values, ideals or aspects of an organization’s identity that no longer reflect and absorb the issues that the organization needs to address and solve. These values will hence be considered as empty and meaningless. The remaining organization then suspects that these appeals rather hide problems instead of solving them, which divides an organization even further. The supposed bridge becomes than an even greater abyss.

system 3 and 5. System 3 sometimes does not want to inform system 5 out of self-interest.⁴

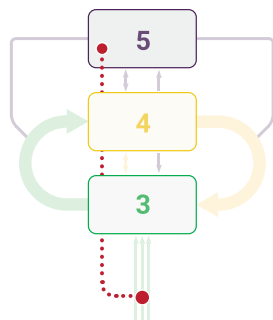
Whatever the reasons might be, system 5 must ensure that it gets informed on time and thoroughly, so that it can counteract before dangerous developments take place and the organization explodes or implodes due to wrong decisions.

1. The Algedonic Channel

To avoid this danger, system 5 must establish a channel to the operational units, the systems 1: not a formalized information, reporting or even command channel. System 5 should not try to replace system 3 and become system 3 itself (e.g., when the chairman of the board of directors takes over the role of the chief executive). For Stafford Beer, this channel is instead one that only transmits warning signals from the so-called “bottom” to the “top” of the organization in the case of substantial changes or imbalances (Fig. 9.3). The channel should not transmit detailed information constantly similar to the channels of system 3 or 3* as this would overload system 5. This channel should rather convey only a basic two-valued signal: “everything is all right” or “this decision hurts really”. And this is all, what a CEO or a board wants to know in the first instance—“everything else is detail” and hence can be dealt with by someone else. “Everything is ok” or “this hurts”, **pain or pleasure**, are the signals that the so-called algedonic channel should transmit.⁵

This algedonic channel has an important stabilizing function for the overall equilibrium of the organization. The metasystem reduces through its decision variety in the organization. However, it could happen that a decision was not correct and excluded important aspects. This could destabilize the organization and endanger its cohesion. “We have not thought about this aspect”, is a comment made by decision makers, when they later face the destabilizing consequences of their decisions. Through the algedonic channel system 5 is made aware of this danger and advised to change or at least to rethink its decision (Beer 1995a: 231).

Fig. 9.3 The algedonic channel (red) (adapted from Beer (1995b: 129, Fig. 36))



⁴ Regarding the principal-agent conflict see the seminal paper by Jensen and Meckling (1976).

⁵ Algedonic is composed of the two greek words algos = pain and hedos = pleasure, hence the “pain-pleasure” channel.

2. Some Examples of the Algedonic Channel

Where does one see the algedonic channel? A historical example is the situations room in the White House in Washington D.C., USA which is considered as a control center for the American president. This is what it is mostly today, but its origin lies in a specific problem. During the Cuban crises, president Kennedy saw himself confronted with the challenge that he did not trust the accuracy and completeness of the information provided by his military advisors (see JFK Library). To resolve this information gap, he ordered that all conversations and pieces of information from the generals (system 3) to the forces on the ground (system 1) should also be transmitted to the White House. To prepare and structure the information the situation room was created. The origin of the situations room, hence, was the need of system 5 (the president) to have an information channel to the channel between the systems 1 and the system 3 of the US military, so to get a good sense of the actual situation—an algedonic channel.

Manifestations of the algedonic channel can be observed in many other ways: politicians and heads of state typically reserve time slots, where ordinary people can visit them, or plan for regular visits with their people, to know what the sentiment of their people is. In companies, algedonic channels are established, when, for instance, the top management visits plants and sites and walks through the production halls and asks employees for their questions and opinions. Experienced executives purposely build up specific relationships with individual employees and allow them to approach them to discuss critical issues: “you can call me if there is a problem.” For these employees, this is not an invitation for constant reporting on all sorts of details, but rather an emergency channel in the sense of: “now, it is enough!”. The algedonic channel should not be used for personal politics or to spy. System 5 should never attempt to replace or weaken lower ranking decision-making individuals or committees.

Jean-Paul Bailly, the former CEO of the Parisian public transport company RATP, which is known for its love for strikes, created, for instance, the institution of the “social alarm” (Fadil and Hafsi 2014: 88). This social alarm allows unions to raise the flag long before tensions erupt into a strike. This “social alarm” has helped to reduce the number of annual strikes and strike days per employee significantly and was made obligatory for every public transportation company from 2008 onwards (Pasquet and Laménie 2013: 61–64).

If one can believe Lawrence McDonald, one of the vice-presidents of the bankrupt bank Lehman brothers than a malfunctioning or not existing algedonic channel was one of the factors for the downfall of the bank (Szalai 2009). According to him, there were sufficient warnings from various experts within the bank, but the “bosses on the 31st floor” did not listen, and even tried to silence or even remove these experts.

Who does not establish and maintain algedonic channels, risks becoming isolated and ignorant concerning decisive dynamics that could lead to explosive situations, whereby the disequilibria resulting from unprocessed variety seek

rebalancing. Revolutions are in fact such adjustment processes, by which a balance is hoped to be restored within a society when the algedonic channels have failed.

3. Closing the Organization by Listening to the Organization

One of the tasks of system 5 concerns closing the organization through its decisions, as we said earlier. However, to decide does not suffice to close an organization. Whoever thinks that just by making a decision an issue can be solved commits a considerable error. Decisions for their own sake are not a solution, but activism. The prerequisite for closing an organization is not the decision per se, but that the organization will accept it, and for this, system 5 must take the organization’s internal equilibrium system into account.

Only who listens to what is going on in an organization has the potential to understand the organization and to make a decision that can be accepted by the organization. The algedonic channel is in this regard an essential instrument and safeguards for the organization’s viability. Through the algedonic channel, the metasystem and, in particular, system 5 stay connected with the remaining organization and can listen to how an organization feels about an individual decision.

“Listening” is thus not just a virtue, it is the precondition for closing and holding the organization together. Through the **algedonic channel, the organization, in the end, listens to itself and becomes a self-informing circuit**, which makes self-regulation possible. The algedonic channel is like the thermometer of the organization: as the thermometer allows better listening and reacting to one’s body and its needs, so does the algedonic channel regarding the organization (Fig. 9.4).

However, for this thermometer to show the right temperature, system 5 must signal that it is **willing to listen** to what will be said. Without this signal, the algedonic channel becomes deaf, because employees consider it futile to send a signal to the upper levels if they feel they are not being listened to. Then, the organization ends up in a situation like in the tale “The Emperor’s New Clothes”.



Fig. 9.4 What is the temperature in your organization? (© Fotolia/stock.adobe.com; artist(s): sv_production)

The algedonic channel becomes transformed into a mirror of the metasystem’s thoughts, perspectives, and wishes, and ceases to be a sensor into the organization and a detector of significant imbalances.

9.3 Balancing the Operational and the Metasystemic Organization

Let us now take one step back and consider system 5 in its entirety. We said at the beginning of this chapter that system 5 does not only decide factual issues on the organization’s strategy but that it must also keep an eye on the organizational stability and coherence. System 5 always needs to do both: to close and mediate, to decide and hold together. System 5 has not only a decision-making but also mediating and conciliating function within the organization.⁶

System 5 decisions always have two dimensions: they decide factual as well as intra-organizational issues. A new strategy also needs the alignment and support of the organization. Whoever wants to reorientate an organization, must reassemble the entire organization behind the new target and vision. Not everyone within an organization can share the new direction, and thus considerable effort in transformation processes is spent on convincing people and generating the commitment to the new direction.

The necessity to consider also internal organizational equilibria in a decision can help us to understand why organizations do not always choose the optimal solution from a purely business-oriented perspective. The decisive decision criterion is then instead whether a certain option will be more supported by its employees or better promote the organization’s internal cohesion, symbolic and ceremonial life or image that it wants to portray to itself and the outside world.

While this is understandable, one must be mindful about the dangers. The inclination toward the inner life of the organization can become the source of severe dysfunctionalities (see also volume 2) if the organization forgets the environment and its original purpose. Whoever listens too much to the organizational and internal equilibrium system through the algedonic channel, risks turning the organization into the primary purpose. The metasystem then becomes “hypochondriac”, because it only stares at its internal thermometer and nervously reacts to every slightest change in the internal equilibria (Fig. 9.5). It forgets thereby what the

⁶ One can observe this double function in values and principles: on the one hand, they decide and separate aspects from the organization in the sense that “we do not want to act in this way or manner”. On the other hand, values and principles must unite the organization. This is not so simple, especially, when values and identities are used to overcome operational problems and tensions. To demand “unity” as value and to exclude controversies does not work, if operational differences are too huge and cannot be talked away. Appealing to values and principles then rather functions counterproductively: instead of uniting an organization such calls lead employees to realize that the values have become hollow and meaningless. Values must hence not only decide conflicts but mediate especially in operational conflicts. Only then can they prove their value.

Fig. 9.5 A hypochondriac organization listens too much to itself, forgetting thereby the environment (© Fotolia/stock.adobe.com; artist(s): Armin Sestic)



organization’s purpose is, namely to serve its customer. These are the organizations that are centered only around them.

Thus, system 5 must find a balance in this duality between a decision that is factually correct given the changes in the external environment and a decision that respects the demands from the internal equilibria within the organization. This balance is perhaps the most difficult to calibrate in an organization.

9.4 System 5—Source for the Organization’s Sense of Responsibility and “Conscience”

Whoever has already exercised a system 5 function knows that in this situation system 5 is left alone. “What do you want?”—No one can answer this question except the person asked. System 5 must hence enter a self-reflecting dialog, in which it confronts itself with the question as to what and to whom it should feel obliged:

What is our responsibility and to whom? What part of the variety in the environment shall we process? What residual variety can be neglected and left to the environment as a result of our operation? What kind of objectives do we want to achieve and what kind of value or negative impact do we create thereby for the

environment and the organization? One must only visualize the many externalities created by an organization and their consequences for individuals and the equilibrium of society, communities, health, life expectancies, environment, and nature.

Being the highest decision-making instance in an organization whose fundamental decisions on the objectives, principles, norms, and values pervade the entire organization, system 5 is the place, where the **question of responsibility** fully emerges within the organization. System 5 must learn that it is or, at least, should become the harbor of what we can call the **“conscience” of the organization**. It needs to understand that it is the **ultimate and last source of responsibility within the organization** and that it hence has the duty to ponder all its decisions and their consequences in the light of the entire system’s viability and livelihood, (i.e., comprising the organization as well as its environment). There is no other system function left to do this.

“The fish always starts stinking from the head,” is a common saying. System 5 and whoever exercises this function needs to understand that they are the **source and guarantor for the level of responsibility within the entire organization**. Only to the extent that system 5 develops this sense of responsibility, the remaining organization will follow and develop the same sense. For the health of the organization, it is important that the representatives of system 5 be aware of their vital organizational function; they are the guarantors for the level of responsibility in an organization

Do you want to know why responsibility is necessary for the overall stability of the organization and why system 5 needs to have “a model of the wider system”?

If so, continue reading otherwise go to Section 9.5

From the VSM’s perspective, we can redefine responsibility as the **awareness of Ashby’s Law and the need to have the organization’s equilibrium systems balanced out**. Calls for more responsibility always are warning signals to an organization that something is “out of balance” and that the organization finds itself in an unstable situation. Irresponsibility, conversely, is the disrespect of Ashby’s Law; it means that the organization attempts to drive on ice without proper tires and driving experience (see Chapter 1).

Responsibility as the awareness of one’s obligation to the demands of Ashby’s Law is then one of the critical prerequisites for the organization to become genuinely adaptive and viable. Only who has this awareness will become sufficiently open to learn and understand what kind of changes and adaptations are needed. Only then one will feel obliged to adapt and change, however harmful these changes might be to oneself.

Evading this responsibility and refusing to see it and means to close the eyes in front of the wider system into which a decision should be embedded and to ignore Ashby’s Law. This behavior, also known as “Head-in-the-sand” policy, brings us to a very important element for a well-functioning system 5:

If the organization wants to preserve its long-term viability, it must make sure that system 5 confronts itself with the effects of its decision on the entire system and does not shut its eyes. To this end, system 5 must represent the entire system in itself⁷; it must create **a model of the wider system** as accurately as possible as its guiding framework.

In more practical terms, the systemic obligation to have a model of the wider system means that, for instance, the board of directors, governors or trustees of an organization must always have **an understanding** of how a decision affects the organization and the environment such as the concrete customers and society. Without this understanding, or, in the VSM’s systemic language, without a model of the entire system the system 5 cannot function sufficiently well. A model of the system is an essential part of system 5. The more holistic and rigorous this model is, the more viable the decisions by system 5 will become.

9.5 “What is Our Value?”— System 5’s Ultimate Responsibility

The challenge for system 5 is that it often faces multiple responsibilities or obligations, for instance, toward different stakeholders. Thus, to whom does it owe its ultimate responsibility? This is not a purely theoretical and academic question but an immensely practical and albeit complex one. The VSM does not provide us a magic “fit-for-all purposes” solution, but it points us into a direction, to where system 5 must look in the end:

Organizations, we said earlier, are not an end in themselves (Drucker 2006: 15). Organizations are founded on their ability to process the variety of their environment, and for this, they receive resources.⁸ **Their existence, livelihood, and viability are based on their capacity to produce value.**⁹ Becoming obsolete is the death penalty for every organization. Whatever types of values a company might create, it can only do this because of the value that it concretely creates for its

⁷ We refer here to Beer’s application of the Conant–Ashby Theorem to system 5 and his view that system 5 needs to contain models of system 3 and 4 (Beer 1995c: 352). In our view, system 5 cannot stop there; through the reporting of system 3 and 4, it also must consider the operational organization and the entire environment. This is what system 3 and 4 are discussing about, at the end. In addition, it also must consider the specific perspective of system 3 and 4 and the effects of their perspective on the information presented. Thus, it must build a model of the entire system, i.e., the organization and the environment in which the organization is embedded.

⁸ At the level of system 5, we should not view the relevant environmental variety too narrowly and only focused on the product. Organizations do not only create products, but also many other important positive externalities for a society such as developing the competencies of people, creating meaning, or generating wealth for the communities in which they are embedded (e.g., by the taxes paid). System 5 must always also consider the social and personal effects of its decisions.

⁹ The same applies to the “financial value” of a company, which is *inter alia* based on the value that it can produce concretely for its environment now and in the future (current and future revenues).

primary environment. The value produced for shareholders (profits, dividends, and valuations by capital markets), employees (wages and employment) and state (taxes) can only derive from this value. The **ultimate responsibility of system 5 is hence to ensure that the organization can and does contribute value to the environment** (see Chapter 1): to the partial environments of the systems 1 and the wider primary environment as well as to the present and future environment.

It is no coincidence that now at the “top” and ultimate authority of an organization we are forced to return to the point, where we started our in-depth discussion of the VSM: **the systems 1 in their entirety**.¹⁰ The systems 1 are not by chance the systems 1. They are the foundation and pillars of the organization; without them, the organization cannot exist. The systems 1 are the places, where the purpose and value of the organization are created. Here, the product and customer emerge as the result of the interaction process between the organization and its environment (Chapter 3); and only through creating a “product” and a customer can the organization come into existence and continues to exist.

The responsibility to create value and purpose thus ties the system 5 and the entire metasystem back to the operational basis of the organization and vice versa. **The discussion about the purpose and value created by the organization is what ultimately brings the entire organization together.** The purpose of the organization defines which varieties need to be processed and what kind of external and internal balance must be found. The purpose that the organization can and wants to create for the environment is and should be the beacon for system 5’s decisions.

The **focus on the concrete value** is essential for another reason: as above discussed above, system 5 and with it the **entire metasystem can become detached from reality, abstract, and an end in itself** (Drucker 2006: 15). We all know decision-making bodies that are only able to talk in abstract terms of reality and what “real” life is supposed to be or focus only on specific segments of the environment such as certain stake- or shareholders. To avoid this from happening, system 5 must ultimately and always **keep the real value creation in mind** in its decisions. Whatever law the state legislates, whatever the school decides to teach, whatever a religion prescribes, whatever business policy a company defines it must benefit their primary environments, whether it be citizens, students, believers or customers as well as the concrete society.

In the episode “Compassionate society” of the classic British sitcom *Yes Minister* (Lynn and Jay 1989: 197), the minister Jim Hacker visits a hospital staffed just with administrators but without patients, since the budgetary situation does not allow employing any medical staff. However, the head of administration tells the minister with pride that the hospital is one of the best run and most hygienic hospitals in the country and that it is up for a prestigious prize. The administration and smooth running of the hospital have become an end in itself.

¹⁰ By “entirety” we want to express first, that from an ecosystem perspective the term “system 1” always includes the environment and second, that system 5 needs to consider all systems 1, both now and regarding their future development.

How the minister then reacts is what system 5 should regularly do, namely, to place the purpose and value again into the center of attention. “A hospital is not a source of employment, it is a place to heal the sick”, the minister Jim Hacker reminds the head of administration. The setting of this episode is certainly an exaggeration typical for sitcoms, but the point made is well exemplified: one must always ensure that the organization’s purpose and value contribution remain at the center of the entire organization’s decision-making, actions, and deliberations—and this is not a given!

Whoever has already taken part in system 5-type discussions that have become detached from reality and dominated by specific interests and interest groups, knows that there is nothing more clarifying, fruitful, and healing than to revert to the **concrete needs of the environment** that an organization wants and should address. This lets one prioritize what one should do, what are the first things to do, and what one should not be doing at all.

Turning to the real purpose and the systems 1 does not mean that system 5 should become involved and burdened with operational details of the systems 1. The point instead is that the value creation by the **systems 1 should function as a point of reference and guiding principle for system 5** like the Polar Star or the radio guidance systems for airplanes trying to land at an airport. Value creation, purpose, the systems 1 and their environments must always remain in the center of system 5’s deliberations and decisions. This focus is constitutional for a functioning and healthy system 5.

We mentioned earlier that through the algedonic channel system 5 and with it the entire metasystem is related back to the operational organization. However, activating the algedonic signal should be the exception, since it arises only as the result of an already taken wrong decision. Viewed from this angle, system 5 needs to prevent the algedonic signal from becoming initiated at all; the signal already comes too late, the crisis has already broken out. To prevent this, system 5 must thus have the systems 1 and their value creation always in mind before it decides. If system 5 can create value and purpose through its decision, the systems 1 will follow its decisions more willingly how difficult and painful they might be. System 5 then provides a reason and purpose for the pain that it might create through its decision.

At the beginning of this chapter, we said that system 5 must balance between the strategic and the inner-organizational dimension. Focusing on purpose and value creation is what will help system 5 to hold both dimensions together.

Summary

- System 5 must ensure a balance within the metasytem in two ways:
 1. Between system 3 and 4
 2. Between itself and the interaction between system 3 and 4.
- System 5 can influence system 3 and 4 and their interaction through two channels: the central command channel and the monitoring channel
- System 5 must ensure that the relation between the operational organization and the strategic-normative metasytem remains in balance. For this, it needs to build up an “algedonic channel” that informs system 5 about wrong decisions. The algedonic channel allows detecting misalignments between the metasytem and the operational organization and threats to the organization’s cohesion.
- System 5 is called to justify its decision in view of the viability of the entire system, which consists of both, the environment and the organization. For this, system 5 must develop a model of the entire system and the factors that influence its viability.
- System 5 is the ultimate source of responsibility and conscience in the organization.
- To define its responsibility appropriately, system 5 must search and develop wherein the organization’s purpose and its value contribution lie. Concrete value creation must be at the center of its decisions and deliberations.

Questions for Reflection:

1. How well are the following dimensions balanced out in the discussions in your organization: the operational, innovative-strategic, and normative dimension? Is your organization too focused on either operational, innovative or normative issues?
2. How well does the algedonic channel function in your organization? What are your own algedonic channels? How do you know whether they are working?
3. How well have the system 5 representatives developed a model of the entire system? How well can they estimate the effects of their decisions on the environment, the organization and the organization’s capacity to create value?
4. How strong is the sense of responsibility and commitment toward the business mission in your organization? How well is your business mission reflected in the fundamental decisions of your organization? How much do the organization’s declared business mission and the purpose play a role in the daily decision-making processes of your organization? Alternatively, is the business mission just a decorative “nice-to-have”?

5. How well have the business mission and purpose been developed in a dialogue with the organization’s environment and internal stakeholders? How much does the system 5 in your organization feel obliged to the viability of the organization and its environment?

References

- Beer, S. (1995a). *Brain of the firm* (2nd ed.). Chichester, England, New York: Wiley.
- Beer, S. (1995b). *Diagnosing the system for organizations*. Chichester [West Sussex], New York: Wiley. (Figures 7, 35, 36 and 37 republished with permission of John Wiley and Sons Inc. and the permission conveyed through the Copyright Clearance Center, Inc.).
- Beer, S. (1995c). *The heart of enterprise*. Chichester [England], New York: Wiley. (Figures 21 and 51 republished with permission of John Wiley and Sons Inc. and the permission conveyed through the Copyright Clearance Center, Inc.).
- Drucker, P. F. (2006). *The effective executive: The definitive guide to getting the right things done*. New York: Collins.
- Espejo, R. (1989). The VSM revisited. In R. Espejo & R. Hamden (Eds.), *The viable system model. Interpretations and applications of Stafford Beer’s VSM* (pp. 77–100). Chichester, West Sussex, England, New York: Wiley.
- Fadil, A., & Hafsi, T. (2014). *Jean-Paul Bailly: Réconcilier société et entreprise*. Cormelles-le-Royal France, Montréal: Editions EMS Management & Société; Presses internationales Polytechnique.
- Habermas, J. (1995). *Theorie des kommunikativen Handelns*. Frankfurt a.M: Suhrkamp.
- Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3(4), 305–360.
- Lynn, J., & Jay, A. (1989). *The complete yes prime minister: The diaries of the right Hon. James Hacker*. London: BBC Books.
- Pasquet, I., & Laménie, M. (2013). *Rapport d’information sur le dialogue social et la continuité du service public dans les transports terrestres réguliers de voyageurs* (pp. 61–64). http://www.senat.fr/rap/r13-088/r13-088_mono.html#toc265.
- Szalai, G. (2009). Die Chefs trugen auch Schlagringe. *Der Standard*. September 11.



Simplicity is the ultimate sophistication.
(Leonardo da Vinci)

We now come to an important organizational design principle that is yet seldom sufficiently well understood: recursivity. We have already touched on it several times implicitly but not yet fully embarked on it for didactic reasons. Now the moment has come: what does “recursivity” mean in the context of organizations?

10.1 Vertical Differentiation—An Instrument to Alleviate the Management of Organizations

Let us first start with a problem with which, in particular, fast-growing companies are confronted. Growth and specialization of customer needs increase the number and heterogeneity of environments as well as the corresponding systems and their products. This increase in variety can, however, bring the metasystemic functions beyond their performance limits. In a corporation like GE with many different business divisions and products such as consumer goods (dishwasher, microwaves, fridges) or industrial products such as gas turbines or aircraft engines, it is almost impossible to manage all products from the top level and with one metasystem.

Organizations solve this problem **by differentiating themselves vertically** (Fig. 10.1): instead of controlling all units from one super-unit, they insert an additional level that divides the span of control of the super-unit into smaller units. The “super-unit” at the top level then controls only the new level in the middle instead of all units at the lowest level.

For those of us who have grown up with big and global corporations, this vertical differentiation is self-evident. This has not always been the case but instead, the result of an extended period of experimentation. Alfred Chandler, known for his famous phrase “structure follows strategy”, has described this process of

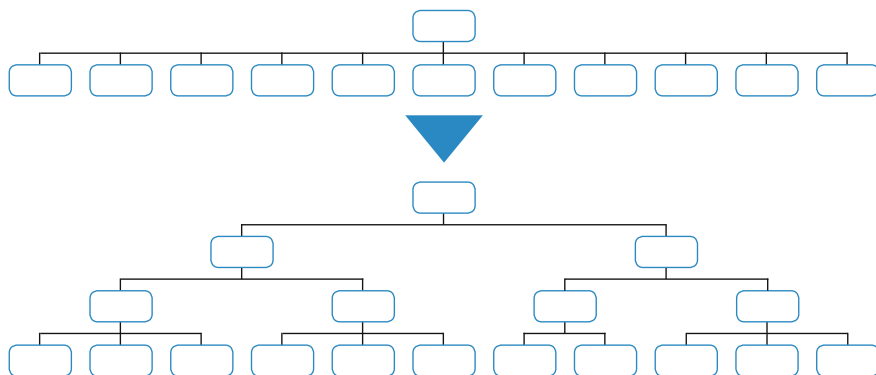


Fig. 10.1 By inserting additional levels the organization gets segmented into smaller and better manageable units

experimentation in detail in his seminal book *Strategy and Structure* (2003). In it, he recounts how US-American companies such as General Motors, Sears or DuPont discovered today's divisional organization through vertical differentiation, only after several attempts.

Divisionalization means that, for instance, product units are not anymore directly controlled by the top executives of a corporation, but by autonomous divisions within this corporation—sort of smaller companies within the larger corporation. For Chandler, divisionalization was one of the reasons for the ascent of America's economy, since it made larger companies manageable and hence possible to create.

10.2 Recursivity in Organizations

10.2.1 The Need for Functional Equivalency

Vertical differentiation as such does not suffice because if every level in an organization must be managed differently then not much is gained. On the contrary, the opacity will increase within the organization and will become a severe threat to its viability. Viable organizations will thus need to achieve **functional similarity** between the levels and among the units of the same level as much as possible. Building hierarchies alone does not suffice; **recursivity** is the essential design principle of viable organizations for Stafford Beer.

Recursivity is known from nature or fractal geometry and means that the same design principles are repeated at every level of a structure (see Fig. 10.2). The golden section, for instance, as the embodiment of beauty and proportionality (e.g., in architecture or paintings) is recursive: the proportions in a building or a painting are repeated at various scales.

Looking at fractals, we can immediately see the **advantage of recursivity**: the repetition of the same patterns, design principles, and proportions across various levels tremendously facilitates the understanding of these fractal structures. We get the impression that with just one look, we can immediately understand the entire



Fig. 10.2 Recursive patterns (© stock.adobe.com; artist(s): Das, Uladzimir und Dean Marston)

image down to the smallest level of detail or at least we can imagine, how more detailed levels will look. Recursivity, or the similarity of levels, greatly adds to the efficiency of understanding structures.

For organizations, recursivity is equally important: the application of the same design and control principles makes it easier to understand how the organization is functioning. If every level works with the same management principles and processes, then it is easier to lead and control it. Recursivity increases the efficiency of control.

In the previous chapters, we have learned that organizations need to have all the systems functions, information, and control loops as described by the VSM. If an organization thus starts to differentiate itself vertically, then recursivity would demand that every new level must be structured and function as a viable system. If levels had only different subsets of the VSM system functions and loops, they would not be similar to each other. This implies that, for instance, a corporation (see Fig. 10.3) that is vertically divided into the levels of divisions, business units, and product or market units is only recursive if every level entails all systems functions as well as information and control loops, as described in the VSM.

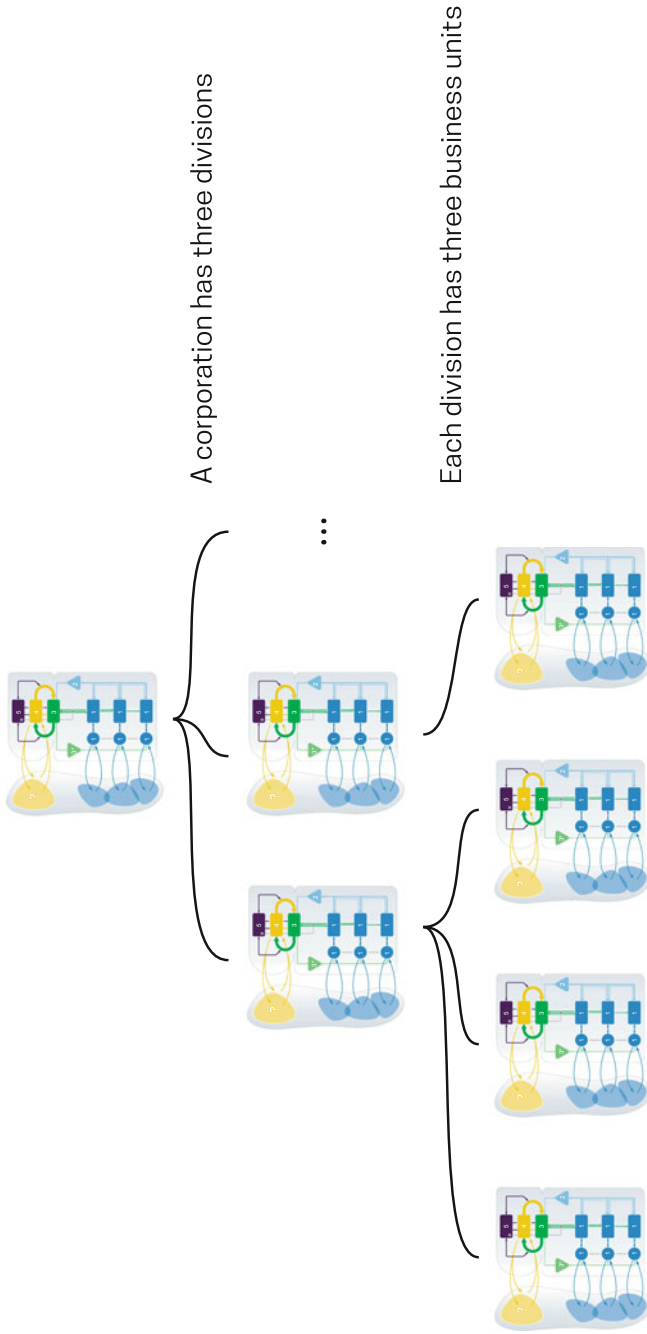


Fig. 10.3 An organization becomes recursive if all systems functions and control loops are fully developed at each level (adapted from Beer (1995b: 315, Fig. 51) and Leonard (1989: 189, Fig. 5))

But, why is it necessary that every level in a corporation operate like a VSM? Why is recursivity so essential? Would not it be in principle sufficient, if specific system functions were not developed at every, but only at a few levels, for instance, the coordination or audit function just at the top of the organization?

To answer this question, let us take the audit function as an example: if lower recursion levels would not also perform audits and inspections, then these tasks must be taken over by the upper levels. However, what would hence be the advantage gained by vertical differentiation? Not very much, presumably, since one gains only if lower levels also audit their areas themselves. A superior must rely on his or her subordinates that they take over full responsibility for their specific area—otherwise the superior will not sense any relief from his burden. He or she will need to continue checking not only on his or her subordinates but also their areas of responsibility. What is valid for the audit function is equally valid for the other systemic functions: coordination and finding innovative ideas is not only the responsibility of the upper levels but also of all levels.

Recursivity hence means that **every level in an organization is called to develop a complete viable system and perform all systemic function for their specific area of responsibility**. Only then, vertical differentiation bears its fruits, relieves the burden borne by the upper levels, and makes the organization more responsive to environmental challenges at the lower levels. All systems functions should be exercised as closely as possible to where the variety that needs to be processed emerges.

10.2.2 “Can’t You Do It Yourself!”—Recursivity and the Need for Self-organization and Autonomy

So far, recursivity looks obvious, but at closer inspection, it reveals a challenging imperative: we stated that every recursion level in an organization must function as a viable system. However, as we said in Chapter 1, viability means self-governance; and the sole purpose of the system functions as described by the VSM is to make self-governance and autonomy possible.

Thus, if all levels need to have all systems functions in place, this means consequently that all these fully developed levels can then become at the end self-governing; what they then quite rightly demand. Setting up or granting decision-making processes makes only sense if one can decide oneself. Being endowed with a mind demands automatically the possibility to use it and act autonomously. Installing the metasystemic processes at all levels and verticalization only makes sense, if the levels can act on themselves as much as possible;

otherwise, they will wither and degenerate. **Recursivity implies autonomy at all levels**, or as Espejo and Reyes (2011: 88) put it so pointedly: "... without (...) self-determination, there is no *recursive structure*."

Autonomy and self-determination have many advantages, especially if viewed from a complexity processing perspective: one can avoid **bottlenecks** and **react to challenges more accurately**. Autonomy and self-regulation reduce the necessary response time and make organizations more adaptive and agile. Furthermore, as pointed out earlier: one is only relieved, if employees are enabled to act and work on their own and if one can delegate tasks to others entirely.

Last but not least, autonomy helps to **react more specifically to problems**. Lower levels often have a better understanding of operational problems than higher levels since they are closer to these problems on an everyday basis. Orr (1996) described very detailedly how the management of Xerox tried to make the repairs of its photocopying machines undertaken by its service departments more efficient. To this end, it standardized the processes and fixed them in mandatory manuals. Unfortunately, these manuals and instructions often did not solve the problems or were not practical. In the language of the VSM, the higher levels could not process the variety of the lower levels—the higher levels were too far away. The service personnel was closer to the problems and has learned over time, by which "tricks" and sometimes unconventional procedures a machine could be made functioning again. So, the creative thinking of the lower levels (so the existence of systems 4 on lower levels) helped to solve technical problems, not the handbooks imposed from above.

Self-governance and autonomy on all levels was also for Drucker (1993: 438–442) an important key to an efficient and effective organization. They also were the real intention behind his **management-by-objectives method**. In Drucker's vision, objectives should enable people to control themselves and become more self-determined, autonomous, and, in the end, be enabled to assume responsibility. This differentiates objectives from instructions and domination: the latter are extrinsically determined and do not relieve higher levels since one has then still to plan all the steps and procedures for the employees. Objectives give direction but allow the employees to seek for themselves the best way to achieve the objective.

10.3 "There Is no Free Lunch"— Vertical Differentiation as a Challenge

At the beginning of this chapter, we said that the vertical differentiation of an organization into recursion levels is an instrument to cope with higher environmental variety. However, there is, as always, no "free lunch" and vertical differentiation also has its drawbacks: it partitions the organization and reduces its permeability and coherence.

What is meant by “less permeability”? To take an example from oceanography and submarine tactics: in oceans, the sea temperature does not fall at the same rate with increasing depth but sometimes changes fast within a few centimeters. These changes in temperature (called thermoclines) have one significant effect: sound waves are transmitted not so easily or are even distorted between water layers separated by these thermoclines. Submarines use this effect to hide because then they are not so readily detectable.

In organizations, we can observe a similar phenomenon: every recursion level works with different factual challenges, time horizons, and rhythms. These differences between levels reduce the **permeability between levels**: one does not understand each other anymore. These “misunderstandings” are perceived as such from both sides: the people “at the top” cannot understand what the people “at the bottom” are doing and why they do not see the same strategic challenges as they do. And vice versa, the people at the bottom have difficulties understanding and following the people at the top. The recursion levels are drifting apart, and clouds of misunderstanding and confusion mount between the levels (Fig. 10.4).

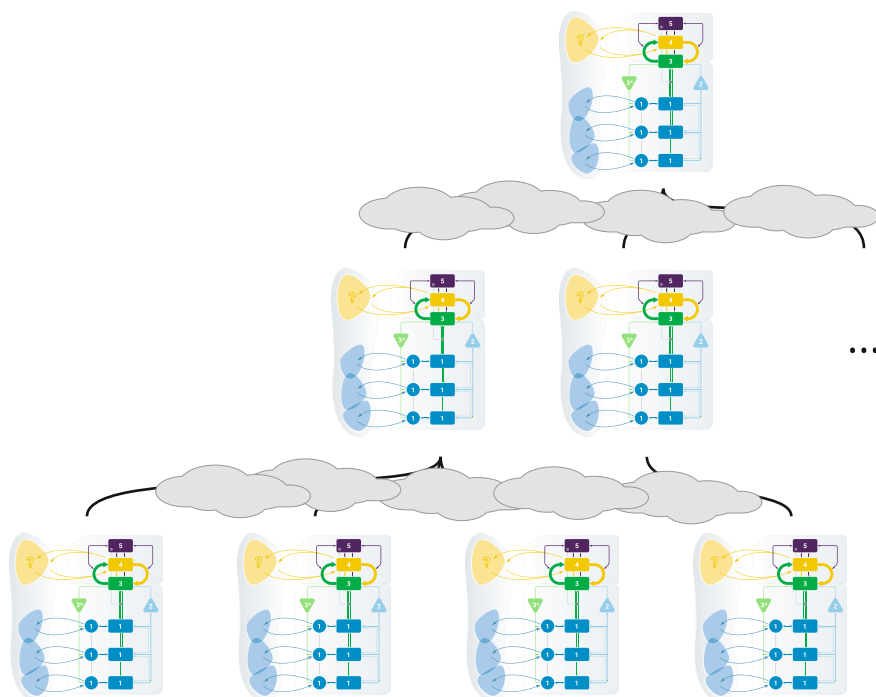


Fig. 10.4 Verticalisation can lead to non-transparency and impermeability within the organization (contains adaptation from Beer (1995b: 315, Fig. 51) and Leonard (1989: 189, Fig. 5))

These difficulties can be witnessed in everyday life and are, for instance, at the core of the “elevator pitch” exercise: “When you enter the elevator and find the CEO of your company in it, what will you tell him/her, to attract his/her attention? You have only five floors time.” The challenge consists not only in the limited amount of time but to know, what is important to the CEO and with what his or her mind is concerned. What is the world of the CEO? The problem is that the CEO’s world is undoubtedly different from the ones of his or her employees at the lower levels and the key challenge behind the elevator pitch is to overcome these different worlds.

The elevator pitch reminds us that the levels of an organization think and act differently and how thin the communication channels between the levels can be in reality. Of course, the difficulty exists for the CEO as well: how and what should the CEO talk about with lower level employees? These employees also live in a world very different from the CEO’s.

However, the **emergence of “different worlds” and lack of transparency** addresses only the **cognitive dimension**; the **volitional dimension** is also affected. Who leaves kids alone at home, can never entirely be sure in what condition the home will be in when one returns. Organizations that differentiate themselves must grant some autonomy, but more autonomy endangers the coherence within the organization. If every recursion level could act as it wishes and its environment demands, this would threaten the cohesion, coordination, cooperation, and synergies within the entire organization.

Diverging recursion levels are not always the result of individualism, but also a consequence of the fact that every recursion level searches for the best way to adapt to the environment. Differences between the recursion levels are often the result of different environmental demands. Autonomy and self-governance thus are no “free lunch” but create their specific challenges. Self-governance can lead to independence and separation. Xerox’s employees invented with their best intentions workarounds, but these new unauthorized practices can also lead to serious problems for the rest of the organization, especially if these practices were neither documented nor tested. “Independence” is only possible, if one remains sufficiently connected to the remaining organization.

10.4 “To Avoid Loose Ends”—Embedding Recursion Levels and Creating Inter-Recursive Channels

To ensure permeability and coherence lower levels need to be embedded into higher levels, similar to the famous Russian matryoshkas (Fig. 10.5). But, what does “embedding” mean concretely? We will now discuss first, the necessity to form inter-recursive channels in an organization, second, the way how these channels should be used and third, how changes in the temporal structure affect an organization’s recursivity.



Fig. 10.5 Matryoshkas (© Fotolia/stock.adobe.com; artist(s): fastudio)

10.4.1 “Knowing Where Your Home Is”— About the Concept of “Embedding”

Embedding the levels into each other means that all levels are in various degrees part of the organization’s entire metasystemic decision-making and control processes. Recursivity means then that a top executive must consider in his or her decisions also the operational level, how distant it might be from his or her recursion level. The lowest levels must always be part of the control model of the upper levels, even if only in a very abstract way. A CEO can and should not lose them out of sight.

The bottom-up direction is important as well: operational levels must always have an eye on higher levels, at least on the essential issues: “what does our action imply for everyone else, our executives, and the entire organization?” Recursivity means that one knows, where one’s home is and to whom one is aligned. It means having all other levels in an organization in mind, and this “mindfulness” is a contributor to the organization’s internal coherence.

Peter Drucker went even further and saw in the interconnectedness the basis for motivation: the more each level understands how it can contribute to the larger organization, the more the people can draw motivation from it (Drucker 2006: 307). The more one recognizes how one’s work contributes to the organization’s objective; the more meaning can one generate for oneself. If one’s efforts just disappear in the big cloud pervading the organization, one loses interest in this organization. Therefore: an organization has not achieved its full potential of verticalization and recursivity if it has not yet made available this view through the entire organization and if the levels are not nested into each other.

Where are the recursion levels embedded into each other within the VSM framework? The answer is relatively simple: where a recursion level starts seeing itself in its entirety and where the (self-)reflection process starts is where we will find the logical interface to the next higher recursion level. The metasytem of a lower level then becomes the system 1 management at the next higher level. Vice versa, the **management of a system 1 is the metasytem for the subordinated operational processes** that produce the purpose of the organization (Fig. 10.6). Now, we come to the aspects that we have already discussed earlier (such as in Chapter 3) and that we are now able to explain: every management of a system 1 must have developed all metasytemic functions.

We can identify this embedding well in practice: for a higher level, the relevant contact person is first and foremost the management of the next lower level and not so much the operational units below this management. The connection between two levels always goes through the control centers of both levels, from “head to head” so to speak.

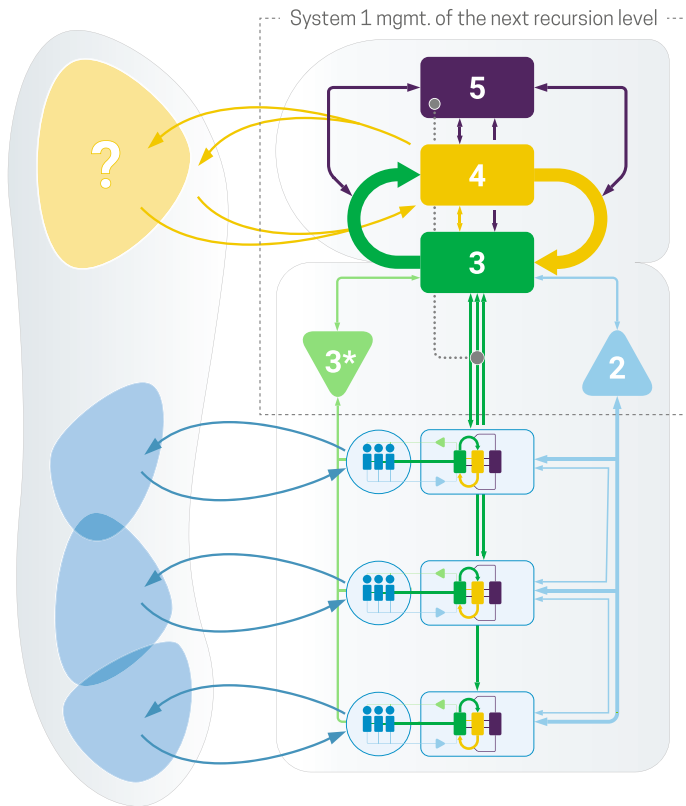


Fig. 10.6 A recursion level is embedded in the next higher level (adapted from Beer (1995a: 136, Fig. 37))

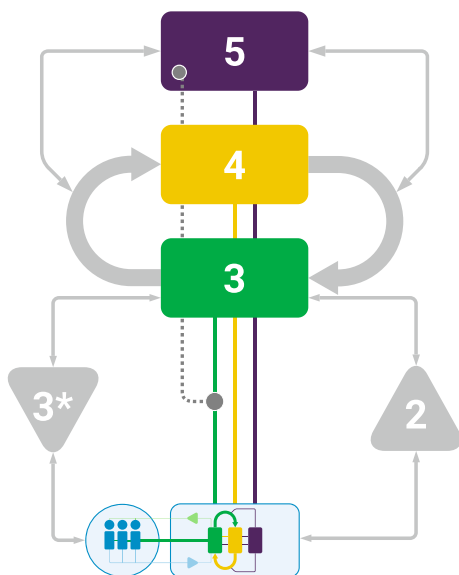
10.4.2 Between “Laissez-Faire” and “Straitjacket”— How to Design and Use the Inter-Recursive Channels

Embedding also means that the same metasystemic system functions of the various levels are connected through so-called **inter-recursive channels** (s. Fig. 10.7). This means that all budgeting, innovation, auditing or policy formulating functions across all levels should be connected to each other.

The use and design of inter-recursive channels are more intricate than one typically assumes. It requires delicate balancing: on the one hand, they should connect the levels so that they do not drift apart. On the other hand, the connection should not be so tight that the individual levels lose their ability to adapt and control themselves autonomously. The levels should not become the puppets of an individual level (be it the top or bottom level—both cases are possible). If levels are connected to each other too forcefully, in the end, this leads to the disappearance of their metasystems. The level becomes then effectively absorbed by the metasystem of another level.

Hence, the inter-recursive channels must connect without making the organization too tight and inflexible. The channels should be neither simple information channels, because this alone would not create sufficient coherence and alignment, nor should they be pure command channels, since this would endanger their autonomy. It is a very thin line about how these channels should be designed, managed, and used. Rather, than being just information or even pure command channels, they should be first and foremost used to induce and promote the **process of mutual assimilation and (self-)similarity between the recursion levels**.

Fig. 10.7 The inter-recursive channels between the systems 3, 4, and 5 of two different recursion levels (adapted from Beer (1995a: 136, Fig. 37))



The key term here is **similarity, not sameness**. The recursion levels should not become clones of each other. The vital point is instead to achieve a mutual understanding and establish a common ground that yet grants sufficient freedom and flexibility to each level to respond to the complexity of its environment. This requires a **mutual adjustment and learning process** between the recursion levels to take place, where all levels adapt their initial position and converge towards each other.

Organizations can use different instruments to cultivate (**self-**) **similarity and mutual adjustment** between recursion levels¹: these include formal instruments such as planning instruments, norms, standards, and rules, but also more interactive and informal ones such as

- In-house management academies and joint training programs, through which the participants can adjust their perspectives and models and mentalities to each other and the requirements of the organization.
- Team-building activities, which allow getting to know each other.
- Management meetings and gatherings that allow developing a corps spirit and elite mentality (see especially Selznick 1984).
- Also, the selection and nomination process of executives and managers is geared towards establishing similarity between recursion levels: top executives or units at the top try to nominate managers who share the same understanding and are like them.

The importance of these inter-recursive channels becomes especially apparent when managers or executives do not cultivate them or reduce them to pure information and command channels. They then find it often difficult to generate sufficient trust and support from other recursion levels, whether it be the upper or lower ones. The inter-recursive channels are not only there to share information and distribute commands, but also to know each other and understand each other's perspective better. Only, if this **mutual understanding** is generated, can the inter-recursive channels work well and allow generating the necessary cohesion, while permitting a relatively high degree of autonomy and self-governance.

Organizations that fail to implement these inter-recursive channels risk becoming unmanageable and are forced to reduce their vertical differentiation. In the end, the lower levels will be beheaded of their metasystemic functions, and the organization will be controlled and managed only from the top. The verticalization becomes then abolished: one level controls and does it all. Unless the organization does not have a straightforward business and process model, this scaling back slows down the organization and will make it inflexible.

It is a delicate balance that one must strike, and it has implications in particular regarding the **treatment of mistakes or wrong behavior**. Neither can one let everything go, nor can or should one constantly command others what they

¹ See Simon (1997) whose book *Administrative Behavior* is dedicated to a similar question albeit rather from the perspective of the individual employee in relation to the entire organization.

should do. But how can this be accomplished without endangering the recursivity by overruling and “beheading” the employees? How to correct other people without making them feel redundant and obsolete?

Experienced executives and managers resolve this paradox first by applying “**tact**” or in the VSM-language by dividing **the inter-recursive channel into two frequencies**: misconduct and errors are identified and discussed openly but in a nonpersonal way. In parallel and in a private conversation follows the personal correction or even “dressing-down” if needed. This way, the responsible and main culprit can save his or her face and continue his or her function in view of the others.

Second, they make use of the very nature of recursivity and that every level is endowed with a metasystem: to change one’s mind (so the metasystem) one should use and not fight the other’s mind. “**Leading with questions**” is here the right approach. Instead of a top-down discourse on the right or wrong behavior that risks going in one ear and out of the other, one should better guide the culprit to the right behavior through questions. Questions stimulate thinking, and self-reflection and they also **reinforce personal** responsibility. Questions do not only preserve the metasystem, but they also stimulate it and make it grow.

**Do you want to know, how the acceleration of the environment and agile management methods affect the recursivity of the organization?
If so, then continue reading, otherwise, go to Section 10.5**

10.4.3 “Can’t We Move Faster?”—Today’s Danger to the Organization’s Temporal Recursivity and Cohesion

Whereas Stafford Beer viewed recursivity mainly from a factual perspective, it is the temporal dimension today that is the source of many challenges to an organization’s recursive structure. Organizations are today exposed to ever accelerating speeds and shorter time horizons. This makes it very demanding for them to synchronize all recursion levels. Higher levels must act and decide in shorter time intervals. They can no longer provide the necessary stability and relief to lower levels through long-term planning horizons.² The “long-term” horizons at the board-level sometimes do not go beyond the next quarter, which renders fundamental decisions almost impossible although needed by lower levels.

We can, however, also observe an acceleration at lower levels, which leaves higher levels behind: the traditional hierarchical structures with their

² As evidence for this trend, one only needs to look at the time horizons that are today available to strategy projects.

division of responsibilities into positions and jobs have become too slow for the needs of the operational basis. Operational units need faster decisions by higher levels, and they become more reluctant to wait for them. They want to induce changes and improvements more quickly in the form of self-organizing teams. “Flexibility” and “agility” have become the new paradigms for organizations.

We can, in turn, also notice a certain unease at the upper levels regarding agile management methods. Agility and calls for more entrepreneurship within an organization create the fear at the upper levels that they might lose control over the organization. Top levels often feel being left out or behind, respectively, being exposed to an increasingly opaque operational organization.

From whatever perspective one views organizations (top-down or bottom-up), one notices how the time horizons of the various recursion levels drift apart from each other and how organizations become unable to nest the various levels into each other. The **temporal recursivity of organizations** becomes increasingly endangered, and this applies, in the end, also to the organizations’ cohesion. If, however, the environment accelerates, one cannot slow down to ensure cohesion: the call for deceleration, although tempting, is utopian. To demand faster decisions and actions does not suffice either, the problem is more complicated than just a lack of willingness and speed.

Higher recursion levels are the focal point of many decisions; and consequently, faster paced decision-making rhythms and shorter response times are demanded especially from higher recursion levels. In VSM language, they need to increase their temporal *eigen*-variety. “The bottleneck can often be found at the top of the bottle,” is a famous saying. To meet this challenge higher recursion levels can try to increase their time budget, either by expanding the staff or working more efficiently. These measures, however, are only possible to a certain degree: extra staff costs and even increases the internal complexity, and time management methods also have their limits, especially if it comes to the psychological limits of the human brain.

To avoid bottlenecks and still increase the internal speed and agility, the delegation of tasks and responsibilities to lower levels becomes then the almost inevitable alternative left. As Drucker (1992) rightly pointed out: if decisions must be made more quickly, they must also be made closer to the environment, and this implies delegation. However, is delegation already the solution or only another name for the real challenge that organizations are facing? Is the call for more delegation just masking the problem?

10.4.4 The Challenge of Delegating or Why the Call “You Only Need to Delegate” Does not Suffice

While delegation and its benefits might appear self-evident on paper, it is less so in practice. The question “For what do I need to be responsible and what can I leave to others?” belongs to the difficult and tricky ones for every executive. At this point, we are confronted with one particularly striking puzzle: Even leaders, who are viewed in public opinion as being very open-minded and democratic such as the former US president Barack Obama (Byers 2013) and the French president Emmanuel Macron (Nouzille 2017), are also known for their tight control over all kinds of decision-making processes thus earning them the title of “control freaks”.

Why then is delegation so tricky to implement, even if it is so necessary to gain speed in the organization? What do delegation and decentralization imply for the organization and what needs to be done so that it can work? The VSM and its insistence on the recursive structure of organizations can provide us some clues:

1. Reinforcing the self-similarity across the recursion levels through the inter-recursive channels

Delegation implies granting more autonomy. However, from the VSM it follows that the internal cohesion across the entire organization must be increased simultaneously. Whoever increases the speed of lower levels by decentralizing decisions, must also ensure that all levels continue working together and share the same mindset. To become more agile, one must preserve or even enhance the self-similarity across the entire organization. Otherwise, the organization will drift apart. This is one of the critical challenges of delegating.

To obtain this level of shared understanding, mutual knowledge and trust need to be developed. Decision-makers of all levels thus need to spend more time together, not less. Becoming agiler and delegating more means then, quite paradoxically, investing more time to maintain or even develop a shared sense of the purpose, strategy, decision-making principles, and the way how the organization is functioning. It also means reinforcing the auditing channel to make sure that everyone stays on the famous “same page”.

2. Delegation requires the development of the metasystemic competencies at lower levels

Reinforcing the inter-recursive channels to strengthen cohesion and self-similarity does not always suffice. One is often faced with the challenge that the metasystems of lower levels need yet to be developed.

Delegating responsibilities never means simply transferring an operational task in a narrower sense to lower levels. Every operational process also has a metasytemic dimension: it affects other processes and thus, must be coordinated, audited and further developed. From the VSM perspective, delegation thus also necessitates delegating the corresponding system 2–5 functions to lower level metasystems; something that is often forgotten.

At this point, many executives and managers experience a near-physical pain because they are aware that lower levels might not yet be ready to take over the corresponding metasytemic functions. “I would like to delegate, but the people are not yet up to decide and think strategically,” one often hears. The delegation of tasks also implies the need to develop the corresponding metasytemic capacities of lower levels such as being able to coordinate, plan a budget, establish responsibility, audit, innovate, and make fundamental decisions.

Delegating hence requires investing in people and their metasytemic capabilities and this, in turn, necessitates involving people in the upper level’s metasytemic processes. This must be done early and not just at the point when tasks need to be delegated. A strategic mindset needs time and experiences to develop. This, in turn, implies that metasytemic processes should not be kept to the upper levels only, but shared throughout the organization so that lower levels can develop early the necessary metasytemic understanding and acquire the corresponding competencies when they need to take over tasks and relieve the upper levels. Saving time through delegation thus not only means investing time but also starting early with the development of metasytemic competencies.

3. Redefining existing leadership and control models at all levels

The metasytem is never just a position or a job or the execution of a process. From the VSM’s perspective, the metasytem is better understood as a set of control models on how to lead, manage and regulate an organization (see Section 3.4). If acceleration requires more autonomy at lower levels, then, according to the VSM, one must also change the models that determine how the metasystems and its people act and decide.

Agile management methods must be particularly sensitive to this aspect. They implicitly demand considerable changes in the leadership and control models of people, and consequently, in the personal role and contribution of managers and executives. It does not suffice to demand change and faster speed; also, one must always address the mental models of decision-makers at all levels. If one wants to walk faster, then

one also must make sure that the head follows in the same direction and at the same speed.

To sum up these three points up: Changes in the temporal structure are not only about speed and pace. They affect the way how variety is processed and controlled throughout the entire organization. Driving a car faster requires more experience, better tires, brakes, frames, stabilizers, and control systems. Likewise, to accelerate an organization, one also needs to adjust all its metasystemic functions at all levels and the inter-recursive channels. Without keeping this systemic perspective in mind, the organization will either be torn apart by just “stepping on the gas pedal”, or, in the end, delegation and agility as a current management approach will be rejected by the very organization and the organization will become even more tightly controlled as a counter-reaction to cases of failed delegation.

10.5 Hierarchies and Recursion Levels: Are They the Same?

Based on what we have said so far, it may already be apparent that our current understanding of hierarchical levels and recursion levels do not always coincide. Hierarchical levels in the organizational chart can correspond to recursion levels but do not necessarily so. The reason is that hierarchical levels are not always what they pretend to be from a systemic perspective since not always all of their systemic functions have been fully developed. We can detect the divergence in comments such as: “you know, this manager/executive cannot really decide anything, he or she is just reporting the information to higher levels” or “this superior is just coordinating us.”

Looking at hierarchy levels, one often gets the impression that they are not fully developed recursion levels, but represent just one element of a recursion level. Examples are, for instance, levels that are in reality only information channels between two other levels, or those that exercise just a coordinative function (system 2), or those that act only as reinforcement for the metasystem located at the next higher level to which they instead belong.

A **hierarchical level is only then a fully developed recursion level** if it

1. ... manages systems 1 or parts of system 1 processes that produce or take part in the production of the organization’s purpose,
2. ... coordinates system 1 processes (System 2),
3. ... allocates resources and generates synergies (System 3),
4. ... audits system 1 processes (System 3*),
5. ... explores and reacts to the challenges of a wider external environment and future (System 4),
6. ... formulates common principles and norms (System 5).

Also, a recursion level can only exist sustainably, if these tasks cannot be accomplished by any other system 1 or recursion level better and more easily. Thus, for “healthy” recursion levels **the real need for metasystemic control** is an integral part of their existence. If this need is not given in an organization, severe conflicts for competencies and responsibilities will continuously emerge thus putting the artificially created hierarchy level into question or slowing the organization down. We will discuss these issues more in-depth in volume 2 and 3.

At the end of this chapter, a quick comment on the terminology sometimes used by VSM experts: when organizations are analyzed and designed, one selects the level that should be changed or analyzed primarily. This level is called the “system-in-focus”. Recursion levels are then counted starting from this level. The recursion level in focus is then designated as “R 0”. Lower levels are counted downwards with a negative sign (R -1, R -2, R -3) while higher levels are counted upwards with a positive sign (R +1, R +2, R +3).

Since recursion levels function interdependently, one should never analyze just one level: one should always consider at least the level below and above the system in focus. Many problems in the system in focus can stem from problems and dysfunctionalities at other levels than the system in focus.

Summary

- If the environmental variety to be processed increases beyond the capacity of the metasystem handling this variety, this organization needs to differentiate itself vertically by introducing additional levels of metasystemic control into the organization.
- To obtain the benefits from verticalization, all organizational levels need to be functionally equivalent to each other and be organized recursively. Recursivity means that every organizational level in an organization contains all system functions and information channels and operates according to the structure described by the VSM. To achieve recursivity, all levels must be capable of controlling and managing themselves autonomously.
- To ensure alignment, all recursion levels need to be embedded into each other through their metasystems. Organizations must develop and maintain sufficiently inter-recursive channels between the metasystems of the various levels so as to ensure the necessary coherence and alignment between the levels. The metasystems of the different levels must sufficiently assimilate and align with each other regarding their control models, practices, principles, and instruments.
- Recursivity implies that each level of an organization should be, in principle, comprehensible from the perspective of all other levels (so, from the top as well as from the bottom level). All levels must be transparent regarding their primary modes of functioning to the other levels.
- Hierarchical levels are only then recursion levels, if they are structured as viable systems with all system functions and control loops.

Questions for Reflection:

1. How much are the hierarchical levels in your organization fully equipped with all systems functions and hence fully operational recursion levels?
2. How well are the hierarchical levels connected to each other, in particular regarding the metasystemic functions? How does your organization ensure that there is a continuous and fluid exchange of information between levels?
3. How well can executives and employees adapt to the languages and perspectives of the various levels in your organization?
4. How well developed is the similarity between the hierarchy levels in your organization regarding values, principles, processes, and instruments? How well does your organization ensure and cultivate similarity between the levels?
5. How strong is the level of self-organization in your organization? How much are the levels constrained by higher levels so that they cannot develop their full potential with regards to their specific purpose and environment? How much do lower levels “what they want”?

References

- Beer, S. (1995a). *Diagnosing the system for organizations*. Chichester [West Sussex], New York: Wiley. (Figures 7, 35, 36 and 37 republished with permission of John Wiley and Sons Inc. and the permission conveyed through the Copyright Clearance Center, Inc.).
- Beer, S. (1995b). *The heart of enterprise*. Chichester [England], New York: Wiley. (Figures 21 and 51 republished with permission of John Wiley and Sons Inc. and the permission conveyed through the Copyright Clearance Center, Inc.).
- Byers, D. (2013). *Sanger: ‘This is the most closed, control-freak administration I’ve ever covered’*: Politico.
- Chandler, A. D. (2003). *Strategy and structure: Chapters in the history of the American industrial enterprise*. Washington, D.C.: Beard Books.
- Drucker, P. F. (1992). New society of organizations. *Harvard Business Review*.
- Drucker, P. F. (1993). *Management: Tasks, responsibilities, practices* (1st ed.). New York: HarperBusiness.
- Drucker, P. F. (2006). *The practice of management* (1st ed.). New York, NY: Collins.
- Espejo, R., & Reyes, A. (2011). *Organizational systems: Managing complexity with the viable system model*. Heidelberg, New York: Springer.
- Leonard, A. (1989). Application of the VSM to commercial broadcasting in the United States. In R. Espejo & R. Harnden (Eds.), *The viable system model. Interpretations and applications of Stafford Beer’s VSM* (pp. 175/209). Chichester, West Sussex, England, New York: Wiley. (Figure 5 republished with permission of John Wiley and Sons Inc. and the permission conveyed through the Copyright Clearance Center, Inc.).
- Nouzille, V. (2017). Les hommes du Président. *Le Figaro Magazine*, 17, 46–54.
- Orr, J. E. (1996). *Talking about machines: An ethnography of a modern job*. Ithaca, N.Y.: ILR Press.
- Selznick, P. (1984). *Leadership in administration: A sociological interpretation*. Berkeley, Calif: University of California Press.
- Simon, H. A. (1997). *Administrative behavior: A study of decision-making processes in administrative organizations* (4th ed.). New York: Free Press.

“If We Knew, What We Know ...”— Organizations as Information, Transduction, and Power Systems

11

One gram of information counts more than a thousand tons of opinions (Gerd Bacher, head of the Austrian broadcasting station ORF)

All meanings, we know, depend on the key of interpretation
(George Eliot, author)

All things are subject to interpretation. Whichever interpretation prevails at a given time is a function of power and not truth
(Friedrich Nietzsche, philosopher)

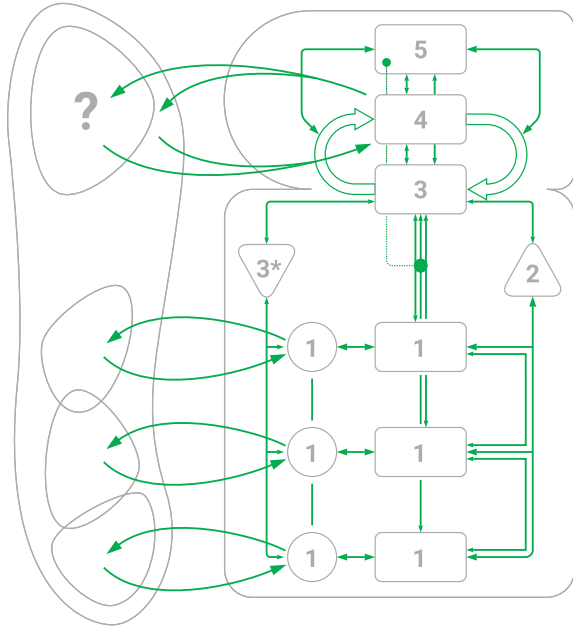
We have now described almost all elements of the VSM, except one: information. Information connects the individual system functions to each other and the environment. The role of information will be the focus of this chapter.

11.1 Organization as Information System

Men, machines, materials, or money can be moved by many things, but, as we become aware especially in our time, information plays a key role in it more than ever. The better we can connect people and physical objects with each other through information, the more we will be able to perform ever more complex tasks (e.g., “internet of things”). Peter Drucker (2006: 346) even went further by pointing out that information in the sense of language is perhaps the only tool that an executive has for leading, motivating, and organizing an organization. Information holds and brings an organization together (Jackson 1989: 418).

If we look more closely at the VSM, we see that it is also conceived as an **information system**, or more precisely as a system processing information. Viewed from a purely formal perspective, the essential task of the system functions (especially the metasytemic ones) is to receive, process, and transmit information, so as to induce changes in the system. Every line in the VSM represents information channels between the different system functions (Fig. 11.1).

Fig. 11.1 The VSM as information system (information channels in green) (adapted from Beer (1995a: 136, Fig. 37))



11.2 “People Do Not Seem to Understand Me ...!”—Organizations as Transduction Systems

However, information is only one part of the story, as we need to rediscover whenever people have misunderstood us. Our current focus on information and information systems lets us forget that information and its transmission alone is not sufficient; information must always be interpreted, i.e., put into a context. For this, one needs the right key for correctly interpreting a message, and since organizations operate in many different contexts, they need many keys, and everyone needs to know which key to choose (Fig. 11.2).



Fig. 11.2 Communication functions only if one has many keys to different contexts and knows which one is the appropriate one (© Fotolia/stock.adobe.com; artist(s): M. Schuppich)

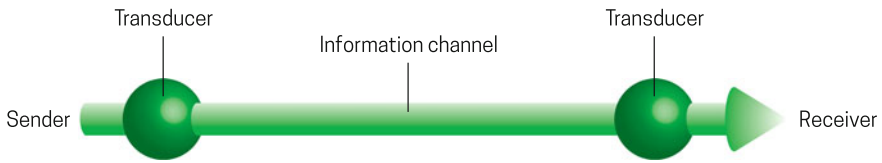


Fig. 11.3 Information is always transduced, i.e., coded by the sender and decoded by the receiver

This brings us to an important, but often overlooked aspect in the VSM: the information system consists not only of information channels but also of the so-called “**transducers**” at each end of the channel (Fig. 11.3). The function of these “transducers” is to code and decode a message into the recipient’s language. Here, Stafford Beer (1995b: 124) purposely used the term “transduction” and not “translation” to point out that the challenge consists not just in the linguistic translation of a message from one language into another one, like from English into German, but in the translation between different contexts.

However, why do organizations need transduction at all? Do not the system functions and recursion levels and the people who represent them speak the same language? After all, are they not part of the same organization? Unfortunately, this is not the case: every system function and recursion level has its distinct perspective and develops its language. Being engaged with different issues and the impossibility to follow and grasp all the problems and issues of all other system functions at the same time creates different contexts for each system function. This is a consequence of the specialization in systems functions.

Thus, we see **various transduction problems** inevitably emerge within an organization (and independently of people):

- **Between recursion levels** (see also Chapter 10): a top executive works in a different conceptual world than his or her subordinates. Whoever wants to talk to a top executive needs to adjust his or her messages to the top executive’s level to get his or her attention. However, transduction must work in the opposite direction as well: messages from the executive board to the entire company must be translated into the language and terminology of ordinary employees and workers. These messages need to talk the language of the man in the street. Public speaking is not only a matter of intelligence but also language and translation between contexts.
- **Between system functions** (see especially between system 3 and 4) or factual or processual dimensions such as between sales or production.
- **Between the organization and its environment** as is evidenced by the frequent call “to talk the language of the customer” or the impression by customers that the company does not fully understand them.
- **Between sender and receiver** in general. There are numerous examples of misalignments between senders and receivers, such as questionnaires whose questions or requested data are open to different interpretations.

Given all these uncertainties, it is probably more likely to misunderstand each other than the opposite (Luhmann 1987: 217). It is perhaps part of the most common misconceptions in organizations that just telling something to someone else automatically implies that the other person has understood the message. Instead, the reverse is the case: one must account and even expect that mistakes and misunderstandings are the “normal” in organizational life.

The above-mentioned leads us to two critical capacities required by organizations

1. The capacity of an organization to transduce correctly.
2. The provision of sufficient capacity for its information channels.

Do you want to know what these capacities imply for the design and development of organizations? If so, the continue reading, otherwise go to Section 11.3.

1. Transduction—the ability to build bridges between worlds

If one looks at the VSM and considers, that, for every communication, a message must be transduced twice, namely by the sender as well as by the receiver, then, one can assess the **importance of transduction**. Organizations are hence not only information systems, as we conceive them mostly today, especially given today’s omnipresence of information technology. The transmission of information is only one aspect of organizational life. Organizations are also large **transduction systems** that need to build bridges (or dictionaries) between different languages, perspectives, and “realities” in an organization—or, at least try to. Nothing is more uncommon than “common sense” (if taken in a literal sense) in organizations. The commonality, i.e., mutual understanding, must yet be constructed out of the Babylonian chaos of the different contexts and languages that exist in an organization. This is one of the most important achievements of organizations.

Transduction is more than translation, as we said earlier. It is the ability to convert information in such a way that it becomes understandable for and within different worldviews and “worlds” without losing or changing its meaning. This ability is not a given but must be developed and trained. It requires that, for instance, executives and employees learn how to understand **different worlds** and then, how to adapt information so that both worlds can understand it in the same way. This implies that they need to conceptualize what constitutes the world of others, as well as what their issues, exigencies, values, and underlying logic and priorities are.

As we can experience it daily, the abstract description of the others’ world does not suffice: how should salespeople come to understand the challenges in production, and vice versa, production managers the difficulties during a sales pitch from a PowerPoint presentation or a fact sheet? We all know that this kind of “information channels” do not provide sufficient variety. They do not allow changing sides so that one can see oneself from the others’ perspectives. Neither do they allow getting immersed with all senses necessary to obtain an in-depth understanding and accurate picture of what is happening in the “worlds” of others. Human intelligence works through the senses, and something becomes only understandable to someone else if it becomes touchable and concrete.

What is thus required are **common experiences** that offer insights into the multi-dimensionality of the others’ world. This can happen, for instance, for production employees through participating in sales pitches and customer meetings, and vice versa, for salespeople through taking part in production planning meetings and spending days in the production lines. We all know how experiences can change our worldview and make the others’ perspectives more comprehensible to us. This has a simple consequence for the information system of an organization: it must be designed in such a way that as many common experiences as possible can be made,—at least, for the people in an organization who must make important decisions.

Transduction thus has a replication process at its foundation: everyone needs to **replicate the organization and its elements within oneself, at least in its essentials**. Everyone must know the perspectives and “worlds” of others. The entire system needs to be recreated and replicated in every individual part. **A common understanding** does not exist outside of the individual’s head; it emerges, only if everyone has recreated the others’ perspectives in oneself. No common view and thus “organization” can emerge just from a collection of autists. To ask oneself “How can and will others view our message?” is thus not a matter of courtesy but the attempt to reimagine the others in oneself, and hence, to ensure that the potential receiver of the message will understand a message.

This explains why many activities in organizations are geared towards the creation of mutual understanding, such as education and training seminars within organizations. They are not just about fun and having a day off from work. They are important platforms to exchange different perspectives among participants and to create a shared understanding and language. Is not one of the most valuable experiences for every seminar participant that one has learned to understand the others’ perspectives during a seminar day, no matter what the real seminar topic was?

What does this imply for an organization’s information system? As already indicated above, this means first and foremost that an information system in an organization should not be reduced just to IT, data, reports, KPIs and so forth. It is more: it is a system, whereby worldviews can be exchanged. The organization’s information system is primarily a **transduction system** consisting of the logics and social processes that help translate between the different worlds and perspectives that exist in an organization. This also implies that the common advice “people need to communicate more” needs to be made more precise although it points in the right direction: people need not communicate more, but they need to develop and improve their transduction competencies. This might also require more communication in terms of time spent together, but above all, it demands the willingness, (intellectual) effort and discipline wanting to understand the others.

2. The need for information (extra-)capacity

Mutual understanding is, however, an ideal situation, since transduction will not always work sufficiently well. Misunderstandings are inevitable in organizations and must be expected. For this reason, Stafford Beer (1995b: 99) maintained that information channels must have at all times higher capacity than the amount of information that they are designed to transmit. Only then can errors be compensated and corrected.

However, what does “**extra-capacity**” mean? Again, we are too easily drawn to IT related categories and forget the human dimension. Extra capacity for an organization means, for instance, to have sufficient time to verify a piece of information or to ask for additional information. In the military, every command is repeated. These repetitions, which should ensure that a command is understood correctly, are such manifestations of extra capacity. The repetition, as annoying as it might be, allows detecting errors and increases the reliability of the command and information channel. The item “Other issues” in a workshop or a questionnaire are considered a nuisance and obsolete, but they also provide additional capacity for critical information to surface if it has not yet arisen. One never knows what one should know, and a predefined agenda might suppress it.

The need for extra capacity also means to design the information system of an organization in such a way, that it does not become flooded. When the financial crisis in 2008 unfolded, the units in the headquarters of a bank that I consulted at that time started wildly firing emails around the organization. People suddenly received 200 emails a day and more from their HQ. This behavior does not make any sense, because who can digest this amount of information? The biological last mile from receiving the email to processing it through our brains does not have the requisite variety to handle this flood of emails. Even worse is the fact that this flood

of information led to even more errors (due to a lack of coordination) and the breakdown of the entire information and control system. In the end, “No one had an overview anymore of what was going on at all” was the feeling in this bank. The entire control and information system of the organization collapsed. To transmit information is cheap and easy today, but this is why one must become even more selective of what kind of information is sent out and to which recipients. The age of emails and instant messaging needs rules and, sometimes, interrupters that keep the organization functioning and viable in its totality.

11.3 Information and Power

Information as a topic is not only relevant for its own sake, but also regarding another important aspect: power. In our time, with its reliance on information, the relation between power and information has become more apparent than ever. One just needs to look at how the Internet is reshaping power structures and access to resources in societies, economies, and entire industries. Information supports power, but it can also question or even topple power holders. Information has its power and those holding power consequently attempt to control or even manipulate it in their interest. Information and power are thus in an inherently **ambivalent relation** to each other.

We can witness this tension in organizations daily, for instance in meetings: if an employee has better information than his or her superior this constellation is sometimes understood as a threat to the superior’s position. Anticipating this possible “misinterpretation” and so as not to appear as challengers to a superior, people keep information to themselves and do not share it much to the detriment of the organization’s viability or even its survival. **Power can then obstruct the flow of information.**

But information needs to flow with the necessary degree of freedom within an organization to reach those that need the information. In crises, it is essential that all information be tabled, no matter by whom and to whose detriment. In crises, we thus see that hierarchical barriers are broken down and that the organization follows the one who has the information that helps the organization out of the crisis (e.g., an idea or plan).

However, to allow information to emerge and be voiced should not be possible in crises only but also in the regular day-to-day operation of an organization. In viable organizations, information should flow as freely as possible. Whoever has the relevant information should also have the power to communicate it in that particular situation: “Authority does not lie,” says Stafford Beer, “in the chains of command, but in the relevance of information” (Beer 2001 quoted in: Pérez Ríos 2012: 14). Organizations should be guided by the **relevance of the information** and not by formal authority.

So, does one no longer need any kind of formal positions with institutionalized power? This, however, does not function either, because organizations need to institutionalize power so as not to lose oversight and become opaque to them. The question: “who has decided this?” needs, in the end, an answer, as we already said earlier in Section 3.4. The key issue is that the institutionalized power and their holders should not become opponents to information and restrict the flow of information. Institutionalized power must instead facilitate the flow as much as possible and be vigilant about this to happen across the entire organization. Therein, institutionalized power shows its true service, value, and greatness for the entire organization. It must build a network that promotes the flow, exchange, and combination of information. Here lies the real power of an organization or as Stafford Beer (1995b: 324) put it: “*Powers in the viable system derive from concatenations of information. They do not derive from the allocation of dependencies (..)*”. Do organizations not become lamed or miss opportunities because the information was not passed on or ideas could not get sufficiently voiced or people have not gotten the full picture of the situation? The **open exchange of information** is thus always a sign of a healthy organization.

It is not surprising that emperors, rulers, and politicians want to convey the image of someone who allows the common man and woman to make themselves heard, especially before elections. Thereby the rulers want to send an important message to the remaining society to legitimize the power they are holding: “Critical information can reach the attention of the supreme decision makers, whenever necessary, and they are willing to induce changes. We are a viable society!” Whether this is really the case, the individual citizen must find out (in most cases does only after elections), but it shows the importance of information and its unhindered flow for the legitimacy of offices and institutionalized power holders.

Summary

- All system functions of an organization are connected through information. The information channels need extra capacity to verify and correct information as well as to remain responsive in the event of crises.
- Organizations are not only information but also transduction systems. “Informing” requires not only the transmission of data from a sender to a receiver but also the transduction of content across different languages, perspectives, and perceived realities. To this end, organizations must put processes in place that facilitate the exchange and alignment of “worlds” and perspectives.
- The information and transduction capacity of an organization between itself and the environment, between the system functions, and between the recursion levels decides on the viability and functioning of an organization.
- Power in a viable system should be based on the relevance of the information. Institutionalized power holders are responsible for promoting the generation, dissemination, and open discussion of relevant information.

Questions for Reflection:

1. Do the information channels in your organization have enough capacity or are misunderstandings or breakdowns in the communication a recurrent phenomenon? How well does the organization ensure that extra capacity in its information channel is provided? How often is the information system overloaded?
2. How good are the transduction capacities in your organization? How often do people misunderstand each other, simply because they do not understand each other's worlds and perspectives?
3. How well are people in your organization trained and exposed to different "worlds" and perspectives, and how well can they transduce between them?
4. How well can information flow in your organization? How much is the flow of information promoted, or is it rather obstructed or even suppressed by the institutionalized power holders or power games in your organization?

References

- Beer, S. (1995a). *Diagnosing the system for organizations*. Chichester [West Sussex], New York: Wiley. (Figures 7, 35, 36 and 37 republished with permission of John Wiley and Sons Inc. and the permission conveyed through the Copyright Clearance Center, Inc.).
- Beer, S. (1995b). *The heart of enterprise*. Chichester [England], New York: Wiley. (Figures 21 and 51 republished with permission of John Wiley and Sons Inc. and the permission conveyed through the Copyright Clearance Center, Inc.).
- Beer, S. (2001). *Vital aspects of viability: The viable system model in management*. Vienna.
- Drucker, P. F. (2006). *The practice of management* (1st ed.). New York, NY: Collins.
- Jackson, M. C. (1989). Evaluating the managerial significance of the VSM. In R. Espejo & R. Harnden (Eds.), *The viable system model. Interpretations and applications of Stafford Beer's VSM* (pp. 407–439). Chichester, West Sussex, England, New York: Wiley.
- Luhmann, N. (1987). *Soziale Systeme: Grundriss einer allgemeinen Theorie* (1st ed.). Frankfurt am Main: Suhrkamp.
- Pérez Ríos, J. (2012). *Design and diagnosis for sustainable organizations: The viable system method*. Heidelberg, New York: Springer.

The VSM— Does it Apply to Real-Life Organizations?

12

There is nothing so practical as a good theory.

(Kurt Lewin, German psychologist)

Now that we have understood the elements and functioning of the VSM, one may wonder, whether and how we can observe this model in reality. Stafford Beer claimed that the VSM is universally applicable to all types of organizations, but is this true?

To verify this assertion,¹ we will now try to describe several types of organizations with the VSM, and we will see how far the VSM can take us. Mapping the VSM to different organizations will also provide us the opportunity to understand the VSM even better and to gain more certainty on how it is applied.

Before you turn the page, I kindly ask you to imagine the following “organizations”² and to sketch them using the VSM:

1. A meeting between different product managers,
2. A project with three subprojects,
3. A corporation with three business units,
4. A family,
5. A school, and
6. The Catholic church.

¹ For a scientific test of the VSM that has corroborated its validity empirically: see Schwaninger and Scheef (2016)

² A meeting and a project are sometimes only “secondary organizations” if they are embedded in a larger organization. In these cases, they are not independent viable systems but fulfill only a specific systemic function of the primary or “parent” organization, such as balancing the variety, respectively, coordinating, controlling, or innovating certain aspects of the parent organization. This distinction between “parent” and “secondary organization” is important, especially for the diagnosis and design of organizations (see volume 2 and 3). Nevertheless, as organizational structures these secondary organizations also need to accomplish systemic tasks as described by the VSM. They thus need to function similar to a viable system.

Start by identifying the systems 1 in these organizations.³ From there, it should be relatively easy to identify the other system functions. Once you have finished, you can continue reading.

12.1 A Meeting

Let us begin with a straightforward example from everyday life; for instance, a meeting between the product managers of a company (Fig. 12.1). The product managers represent the **systems 1** (and of this company). **System 3** is executed by the chair of this meeting.

In most cases, the chair of the meeting also needs to take care of the regulatory tasks such as planning the agenda or finding a venue and date. The agenda, rules of procedure and conduct, language conventions, and so forth regulate the behavior of participants and prevent escalations and misunderstandings between the participants (**system 2**).

During the meeting, the chair gives the floor to participants and takes care that the meeting remains on time. The chair as system 3 is responsible for allocating speaking time to participants as necessary. He thereby manages the **resource bargain between participants** for speaking time. If people repeat themselves, then the chair intervenes to reduce the length of the meeting and create **synergies**.



Fig. 12.1 A meeting (© stock.adobe.com; artist(s): vadim_key)

³ All figures in this chapter related to the VSM are or contain if not stated otherwise adapted detailed views from Beer (1995a: 136, Fig. 37). For the corresponding permission details, see the reference section at the end of this chapter.

A good chair ensures that every participant is sufficiently prepared and engages actively in the meeting. Only then will the meeting have sufficient *eigen*-variety to solve the problems and challenges. Occasionally, the chair will thus check through unexpected questions as to whether all participants follow with their full attention the meeting, or whether they are distracted by other activities (e.g., checking their emails on their laptops or iPads). In doing this, the chair exercises a vital **system 3* function** for the meeting.

The meeting or each topic usually starts with a report by all participants on the status of their activities since the last meeting (**accountability channel of system 3**). This is then mostly followed by reports from the wider environment and future trends of the individual product areas (**systems 4 of the local systems 1**).

During these individual reports, the chair might ask the product managers to report only the issues that are relevant to all the other participants and the entire meeting. The chair makes sure that the participants remain on the appropriate level and do not dive too deep into specifics (**the recursion level is too low**) or touch issues that are beyond the decision-making power of the group (**recursion level is too high**). Put into the VSM language, the chair ensures that the participants target the right recursion level, i.e., the one of the entire group.

Based on the reports from all participants, the meeting will then discuss the various options to move forward (**interaction between system 3 and system 4**). One of the fundamental responsibilities of the chair is to ensure that all participants and all their arguments are equally treated and have the same chance of being brought forward (**balancing function of system 5**). In balancing the views and participants, the chair must ensure that he or she appears impartial. If the group cannot decide between the various options, the chair will try to solve the issue by referring to established principles or experiences made by all participants (“how did we solve this type of problems previously?”). The chair as system 5 also must ensure that certain norms and principles are established such as mutual respect, objectivity, or professional behavior.

One of the essential tasks of the chair is to take care that the group has the competencies, knowledge, and skills present to solve the problems at hand. If the group does not have the expertise, the chair might probably invite specialists to the meeting who amplify the *eigen*-variety of the group. However, the group might also face the opposite problem: that it has too much variety, for example, too many people consider themselves as necessary for the meeting or that there are too many topics on the agenda. In these circumstances, the chair might need to diminish the variety by reducing the topics or the persons invited to the meeting. The chair of a meeting is thus responsible that the variety of the meeting remains in balance: the variety of topics and perspectives must match the resources (especially time) reserved for processing the variety. Hence, the chair also functions as a **calibrator of the variety present in the meeting**.

12.2 A Project

In a project, the **systems 1** are usually the subprojects or work packages, insofar as they are linked directly to the purpose of the project, such as lowering costs, optimizing processes, or establishing a new controlling and reporting system.

The **formal system 2** of the project consists mainly of the classic project management instruments that help to coordinate the subprojects, such as project plans, project standards, common terminology, plans to use shared resources (e.g., rooms, instruments, and infrastructure), and guidelines for how to store and document information and data. Since the environment as well as the challenges of the project change, the project needs institutional coordination spaces that allow adapting the subprojects, work packages, and plans to new circumstances. Regular project meetings are hence an integral part of a project’s system 2. In a project, system 2 must also ensure that the information generated within the project is standardized and that everyone understands how specific KPIs are defined.

System 3 consists, to a great extent, of the project manager and the project management team. The project manager is responsible for defining the targets and milestones for each subproject and for allocating the resources accordingly. An important task for the project manager is to **establish accountability** regarding the use of these resources.

A critical aspect of project management in the classical sense is to break down the overall targets into plans and to adapt these plans continuously (Fig. 12.2). In the VSM language, this is part of the project’s **regulatory center or system 2**. In the classical project management language, this task is taken over by the project controlling. The regulatory center builds up the information and reporting channels, in particular, the ones between the systems 1 and system 3 (e.g., status reports).

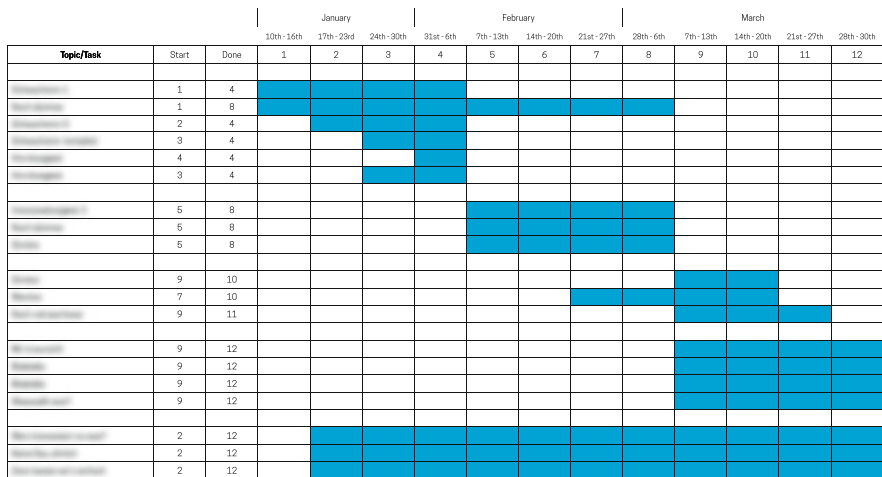


Fig. 12.2 A project plan is a typical regulatory device and part of system 2 (© stock.adobe.com; artist(s): Robert Kneschke)

Vital for every project is, of course, the **system 3* function**. It is well known that status reports are normally too positive with regard to the actual status. Too tempting is it to report a task, work package or subproject to be “nearly complete,” whereas, in reality, it is far from that point. This “90-percent-done” syndrome, where 90% goal attainment are reported early in a project but are never closed to 100%, requires system 3 or the project management to verify the real status of the project. The project manager must thus regularly inspect on the project’s progress by reviewing the results obtained. In big projects, this task is often also taken over by the project controller.

Projects are always embedded in a **wider environment**, in which many other projects run in parallel and where circumstances change continuously. An experienced project manager excels from an inexperienced one by his or her awareness of the wider project environment. A good project manager hence will try to avoid a too myopic and parochial approach to his or her project organization but will always review the project’s implications and position toward other projects.

For this, every project needs a “**look-out**” into the environment of the project and the entire organization (**System 4**). In most cases, it is the project manager who handles the contacts and relations to other and, particularly, higher level units in the organization. However, operational project members can also become such channels, e.g., by overhearing information in the corridors or in front of the coffee machines in an organization. Every project member functions as a potentially important sensor for the project, and projects managers must make everyone aware of their systemic function and encourage them to pass on the information. From time to time, the project manager will thus call all project members to a meeting, where the current situation in the wider environment and the future surrounding the project are assessed and where a common picture on the future path is developed (“**focus**”).

These outbound relations are important since the project is competing for resources and attention. Its fate and success depend on how well it becomes integrated into the wider organizational environment. The management of the **channels, and respectively, relations to the rest of the organization** are thus crucial for the success of a project. This requires a specific competency from the project manager: he or she must be able to “**market**” the **project in the rest of the organization** so that it gets accepted and gets the resources granted in the company-wide resource bargain processes. A project manager who just monitors the operational side of a project (and thus limits him- or herself to the operational metasystem of the project) will soon discover that he or she might lose the support of the entire organization despite all operational successes.

Steering committee meetings exercise several functions: in the status report to the members of the steering committee, the members of the project exercise their accountability toward the steering committee, which **represents the metasystem of a higher recursion level**. Steering committee meetings are also often the places, where important decisions on the future direction of the project are made. Should the project pursue option A or B? In these cases, the steering committee meetings become an institutional space for the **system 3–system 4 interactions**.

The members of the steering committee become then often the **system 5** of the project, must ensure that all views are heard and balanced against each other and that a decision is taken to prevent the project from becoming paralyzed. The steering committee must also ensure that all the information was tabled and that the truth surfaces (as far as one can tell).

Typically, the steering committee does not want to become system 3 or system 4 of the project. It does not want to be involved in the negotiation of the allocation of project resources within the project team or become responsible for the development of new and creative ideas. These are the tasks that should be preferably accomplished by the project manager and his/her team. Steering committees, and their members typically prefer to function just as system 5 of a project and as the representatives of the next higher recursion levels and its metasystemic functions.

As we can see by now, the VSM provides us with a holistic view of how a project organization must function. The VSM can hence serve as an important guide for every project manager on how to set up a project systemically.

12.3 A Company with Three Business Units

After the detailed description and application of the VSM in the two previous cases, we can now describe more swiftly other examples, such as a corporation (see Fig. 12.3).

In a corporation, the **systems 1** are the business units since they are responsible for the products that produce the purpose of the corporation. For strategic issues, **system 3** of the entire cooperation is exercised by the management board. For more detailed and day-to-day tasks, central units such as central procurement, logistics, IT, or production, and their heads sometimes take over the system 3 task of allocating resources to different business units.

The business units are coordinated by agreed strategies, plans, budgets, norms, and standards (**system 2**). The controlling department supports system 3 and the business units by maintaining the company's reporting and planning system and many of its information channels. To regulate the allocation of *eigen*-variety in the form of the company's resources to the business units, controlling develops the necessary KPIs, which measure and make visible the "success" of the company in its environments.

The audit department performs most visibly **system 3*** in the corporation, but not only: consultants, or external experts or whistleblowers or idea boxes also are manifestations of system 3*.

System 4 is mainly exercised by the R&D department, innovation, strategy projects, or units. However, as mentioned earlier, system 4 is distributed across the entire corporation. Many more individuals or units can function as sensors to the wider environment and creators of ideas.

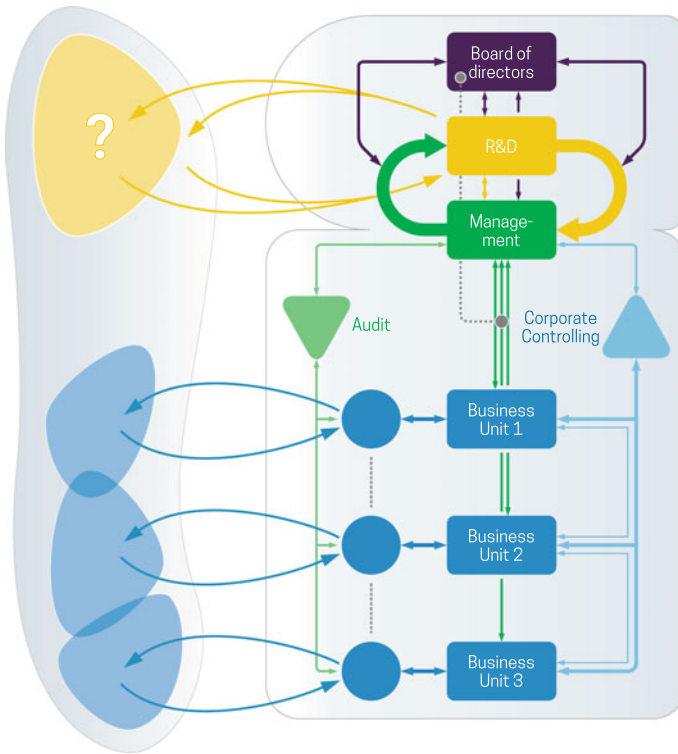


Fig. 12.3 A company with three business units (contains adaptation from Beer (1995a: 136, Fig. 37))

Many individuals or committees can execute **system 5**, but the most visible places are the board of directors or owners (and their families). They define the long-term objectives, policies, guidelines, and norms for the corporation.

12.4 A Family

Let us now turn to more unusual cases, to test the VSM. How would a family (Beer 1995a: 80) as the smallest social unit in human society look like in the VSM (Fig. 12.4)? Can it be described using the VSM?



Fig. 12.4 How does a family work? (© Fotolia/stock.adobe.com; artist(s): Robert Kneschke)

Systems 1 in a family (see Fig. 12.5) are the parents as well as the children. The **system 2** of a family consists of various coordinating mechanisms in family life, such as a shared calendar, an allocation mechanism for resources (e.g., money or time), behavioral and communication standards, and norms. Also, expectations and mutual experiences are important parts of system 2, they regulate family life and can mitigate or even prevent conflicts.

For mutual coordination, institutional spaces need to be set up that make the mutual adaption possible, such as regular dinners or lunches together. These “spaces” allow establishing relations among family members, through which they can coordinate and adapt to each other. If these vital system 2 spaces do not exist, everyone will pursue his or her way and at some point in time, activities will overlap and will not be coordinated leading to conflicts.

If, for instance, one parent plans to take on a new job (**local system 4**), then the system 2 at the family level must take care of the required adjustments, e.g., regarding the resource allocation (availability of others, infrastructure, or means), or the adjustment of timetables.

System 3 is typically taken over by the parents in their role as parents. However, this function may also be exercised by the entire family in the form of a family council. Then, parents and children decide together how to allocate the best their resources (e.g., vacation, hobbies, and time). This decision then becomes binding for every member ... including the parents.

These examples show a fundamental tension in a family that can also be found in every organization: its members may be forced to carry several hats in the form of different systems functions. In these cases, one might be even forced to decide against the self-interests of another system function, of which one is also part. In the case of the family, this means that the decisions taken by the parents for the whole family also bind the parents (as systems 1).

The paradox to be simultaneously the decider (system 3) and the object of a decision (system 1) bears a significant risk in itself: who decides for an option that might be good for the whole organization, but harms oneself? The viability of a family depends on the ability of everyone to assume the right system function and perspective as necessary.

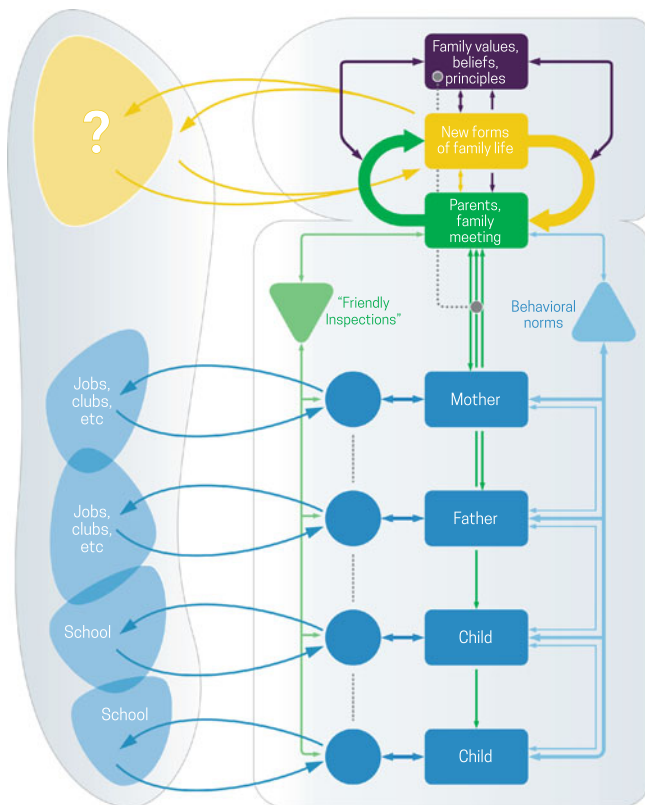


Fig. 12.5 A family from a VSM perspective (contains adaptation from Beer (1995a: 136, Fig. 37))

System 3* is exercised mainly by the parents, when they check how their children are behaving. Whoever has children knows that they also observe very accurately how their parents behave. Deviations from the norm are fast identified and voiced loudly. So, the system 3* function is larger than just the parents, as one would assume, it might include the children as well, especially, if we, as parents, consume the very sweets that we forbade our children.

Families also must develop sensors to their environment and future, e.g., changes in politics, regulations, and support for families. What are these changes, e.g., in the education system, and how are they going to affect us (**system 4**) and how should we react to them? Should we share the latest trends and fashions, such as the penetration of the Internet and social networks into family life through iPads and smartphones? These discussions are manifestations of the **system 3–system 4 interaction**. If these issues cannot be solved, the family, and especially the parents, must take recourse to its life experience as well as to its values and identity, to make a decision (**system 5**). One issue, however, remains not negotiable: a decision must

be made, even to the detriment of some of its members. Otherwise, the family will face the prolongation of conflicts and, in the end, paralysis and internal division.

12.5 A School

School systems operate differently across the globe, but in a generalized way, one can describe a school using the VSM as follows:

The various classes or courses are the **systems 1** of a school. However, what or who is the environment, the operation and the management of these systems 1? The school’s purpose is to prepare the students “for life” or as the Latin adage puts it: “*not scholae, sed vitae discimus*”. The **primary environment of the school and its students** hence is not the school itself, but the students’ future life worlds, i.e., the various life situations and environments, in which they must prove themselves. But the students (and their parents as legal guardians) also form an environment as every teacher well knows.

Schools and teachers thus face **two types of environments** (Fig. 12.6): first, the children and second, their future life worlds consisting of, for instance, trade schools, universities, future employers, the job market, various personal and social life situations, and finally, human society. The school can be consequently viewed as a **transformation process**, whereby the children entering the school as students are expected to leave them as responsible citizens, well-educated adults, and talented job applicants (see Britton and McCallion 1989: 156, Fig. 3). The “graduation” marks the end of this process, whereby students are declared “ready” for their new target environments.

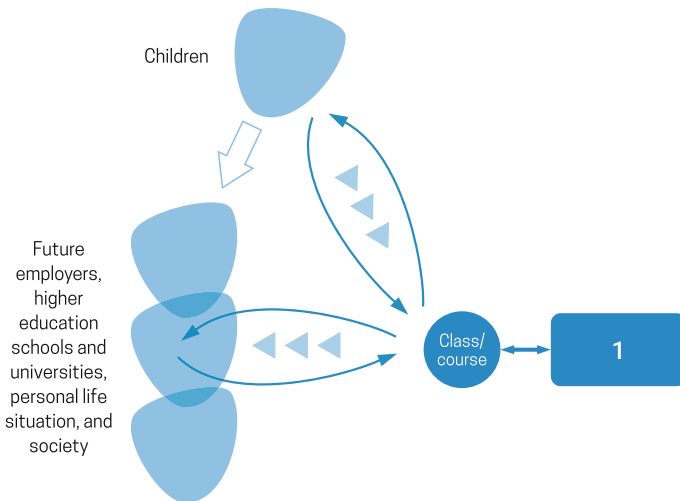


Fig. 12.6 The school prepares the children for their future life through its classes and courses

The place where this transformation of the student's knowledge, skills, and behavior takes place is the class or course. It constitutes the school's **operation** (see Beer 1995b: 458, Fig. 77). For this transformation process, the school can use various "resources" that induce the transformation within the student such as the teacher, books, learning materials, websites, or real-world experiences (e.g., field trips, experiments, or internships). All these resources "teach" the student and let him or her acquire the necessary knowledge.

The key challenge in designing these teaching resources is that they must build a bridge between the children and their future environments. They must balance the **varieties of their students** (talents, character, behaviors, interests, and their parents) with the **ones of their potential future life world**. They should prepare and challenge them but not overburden them and be tailored to the variety of their future environments. The **curriculum**, so the sequence of teachings contents and methods, describes this bridge between the two environments and the path of the transformation process.

Perhaps, it is far stretched to apply the VSM to human beings, but with the VSM we can also describe many of the **general skills** that students are required to learn. Metaphorically speaking, the students themselves must also become **viable systems**. First, students need to acquire specific **operational skills** for their future jobs (**system 1**). However, they also must learn how to organize, coordinate, and plan their activities and duties in daily life (**system 2 and 3**). The students are furthermore required to develop the desire to improve themselves continuously and to be sufficiently self-critical regarding their performance (**system 3***). Particularly in our times, children should also develop foresight, interest in and contact points to the wider environment and the future. Moreover, they should foster their creativity and innovation capabilities (**system 4**). Finally, life is also about making fundamental decisions, and consequently, children need to be trained into how to make sound decisions and how to define or select the principles, values, and norms that should guide them throughout their future life (**system 5**).

Returning to the school: who is its **system 1 management, i.e., the management of a class or course**? They are the teacher themselves. The teacher is entrusted with the management of the transformation process and thus with the use, quality, and timing of the teaching resources mentioned above. The teacher needs to understand and know how to best design and implement the transformation process given the specific circumstances of his classes and students.

And, this applies to him/herself when he/she is actively engaged in teaching. He/she must review the methods that he/she is applying and the progress his/her students are making ("Have I chosen the right approach?"). For this, he/she must also set objectives for him-/herself. The teacher thus exercises a **double role**: he or she is engaged in the actual teaching, respectively learning process, but also needs to manage and review critically how well he/she as teacher performs. How well the teacher can differentiate both roles and continuously challenge him-/herself, decides, among other factors, on his/her teaching performance.

the workload, and the qualifications of teachers. Discussions about the autonomy of schools deal with the challenge of finding the right scope of responsibility assigned to each recursion level in a country's school system.

Each school should also have a fully developed **system 3***, which should be exercised by the school headmaster or his/her deputies. It supervises the teachers' performance. However, this function is often instead carried out by a national authority.

Schools also depend on a well-functioning **system 4** since they are the ones educating and training the students for the future. Without a powerful system 4, a school educates its students only for the present. Hence, schools must also keep an eye on developments and trends in the society and economy, to prepare their students for their future. The revision and adaption of the curriculum, constant training of teachers to new methods and contents are vital system 4 functions of a school. Similar to other system functions, some of the system 4 tasks can be taken over by higher recursion levels depending on the school system into which the school is embedded.

Finally, schools are also places, where society transmits and trains young citizens in its values, norms, identities, and principles. Accordingly, schools must have a well-functioning **system 5** that is capable of formulating, translating, and transmitting principles to their students. System 5 is mainly exercised by the school administration and the teachers, but not solely: parents and various school committees also have a substantial impact on the school's system 5.

12.6 The Catholic Church

Finally, it is tempting to test the VSM with more complex and "exotic" organizations such as the Catholic Church, which is one of the oldest and largest organizations in this world. Can we understand how the Catholic Church functions through the lenses of the VSM?

The Catholic Church mainly consists of three recursion levels⁴: the parishes, dioceses, and the global church directed from the Vatican (s. Fig. 12.8). At the lowest recursion level, we find the parishes as systems 1.⁵ Parishes are then aggregated into dioceses, which are headed by a bishop. These dioceses are then directed by the Pope and by the congregations of the Vatican. The congregations are responsible for the regulation of the various aspects of church life (e.g., bishops, clergy, liturgy, and education) or the Church's relation to its environments (e.g., other churches, nonbelievers, or states) and ensure the operational coherence of the Church.

⁴ We consider here only the religious organization and not the Vatican state. In some cases, there exist additional levels between the parishes and dioceses, but they are mostly not fully developed recursion levels, but rather coordinating mechanisms for the next higher recursion level.

⁵ For reasons of simplicity, we do not consider other possible systems 1 such as Catholic schools, hospitals, universities, and orders.

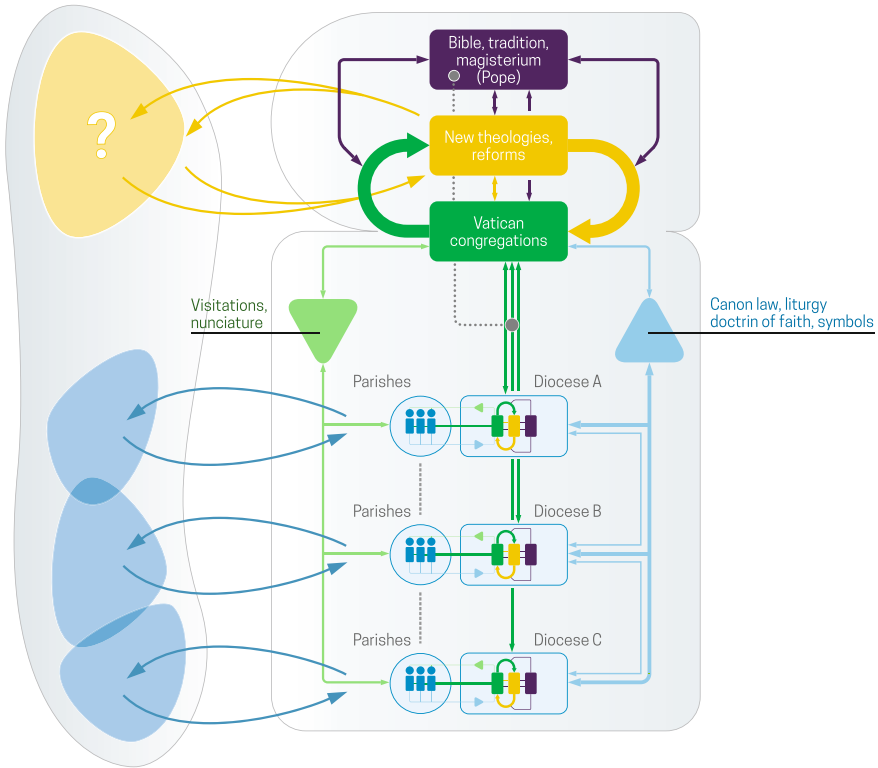


Fig. 12.8 The Catholic Church from a VSM perspective (contains adaptation from Beer (1995a: 136, Fig. 37))

The Catholic Church can be characterized by a potent **system 2**: standard liturgies and symbolism, a unified and standard canon law and theological language ensure that there are not too many differences among the systems 1. They function, by and large, very homogeneously.

System 3 varies according to the recursion level. It can be the parish priest, bishop, or the Pope with his congregations who exercise various control functions. Regular reports, but also the *ad-limina* visits by the bishops to the Pope establish an accountability channel between the systems 1 and system 3 at the global level.

System 3* is exercised at this level, for instance, by the local embassies of the Vatican State, the Nunciatures. They do not only establish bilateral relationships with a state but also monitor the local dioceses and church life.⁶ System 3* also exists at lower levels: it is demanded practice that every bishop visits and inspects his parishes.

⁶ For the Vatican state, the Nunciatures are also the interfaces to other states and international organizations.

To identify system 4 is much more difficult than in traditional organizations: generally, we can see it at work in all the forces that demand change (in whatever ideological direction). This can be reform projects, theologians, or even saints who wanted to influence the church for a change. The **system 3–system 4 interaction** is mostly visible in councils and synods, which are gigantic discussion and meeting places: 2,500 bishops participated in the groundbreaking council Vatican II to discuss whether and in which direction the Church had to change at that time.

What is the Church's **system 5**? Immediately, the Pope and the doctrine of his infallibility come to mind. The Pope is considered as Christ's representative. His decisions in matters of faith have a divine attribute and are final. This representation of God on Earth through the Pope has an important organizational function: it closes the organization. At the level of the Pope, an open issue has reached its end since he also represents the highest recursion level. There is no further recursion level to appeal to, and hence: "Rome has spoken, the cause is finished."

However, this is just one part of system 5: despite its hierarchical structure, the Church knows that the Pope's decision must be embedded in a broader context to be binding: they must be in line with the Bible and earlier decisions. Hence, the Pope is also bound to the Bible and the Church's "tradition", i.e., the interpretation of the Bible through other Popes, church fathers, and decisions by the collegium of bishops such as councils and synods. Through the consultation of earlier teachings, the Pope must find and corroborate his decision. The Pope cannot decide alone; decisions must be made in line with earlier authorities.

System 5 of the Catholic Church becomes then larger than just the Pope and includes, saints, theologians, the community of bishops, and even the "entire body of faithful [who] cannot err in matters of belief" (Lumen Gentium 12). In this regard, even the system 5 of the Catholic Church shows, at least in its theoretical constitution, manifestations of a heterarchical network and "multi-node" of mutual consultation, as demanded by the VSM and Stafford Beer.

References

- Beer, S. (1995a). *Diagnosing the system for organizations*. Chichester [West Sussex], New York: Wiley. (Figures 7, 35, 36 and 37 republished with permission of John Wiley and Sons Inc. and the permission conveyed through the Copyright Clearance Center, Inc.).
- Beer, S. (1995b). *The heart of enterprise*. Chichester [England], New York: Wiley. (Figures 21 and 51 republished with permission of John Wiley and Sons Inc. and the permission conveyed through the Copyright Clearance Center, Inc.).
- Britton, G. A., & McCallion, H. (1989). Application of the VSM to the trade training network in New Zealand. In R. Espejo & R. Harnden (Eds.), *The viable system model. Interpretations and applications of Stafford Beer's VSM* (pp. 145–174). Chichester, West Sussex, England, New York: Wiley.
- Schwawinger, M., & Scheef, C. (2016). A test of the viable system model: Theoretical claim vs empirical evidence. *Cybernetics and Systems*, 47(7), 544–569.

“The Bigger Picture”— Some of the VSM’s Key Messages

13

In all affairs, it’s a healthy thing now and then to hang a question mark on the things, you have long taken for granted.

(Bertrand Russell, Philosopher)

The examples in Chapter 12 showed us, how nuanced and yet intuitively one can describe organizations using the VSM. In the past chapters, we have discussed the various aspects of the VSM at a very detailed level. Now, at the end of this first volume, we want to take a step back and extract some of the VSM’s key messages. What is the bigger picture behind the VSM theory?

13.1 Organization as a System of Ecosystems

Usually, we view organizations in a very isolated manner: organizations as stand-alone entities built and acting like fortresses in a changing world without any or very little interaction with this world. This image mostly results from a picture that we use almost daily in our organizations: the organizational chart.

What is missing in this depiction of an organization? The organizational chart has many advantages due to its brevity, but it also has shortcomings. One of them is particularly severe: it does not include the **external environment**, such as the customer (see Fig. 13.1); or have you ever seen any in the chart of your organization? If we used only the organizational chart as an image, the organization risks losing sight of the customer. Images shape our way of thinking and acting. This is especially critical if organizations grow and the whole attention of organizations then centers mostly around the question of how to maintain the internal (power) balances. Without adequate representation in our models and thinking, the environment does not become strong enough to counterbalance the gravitational forces of inner-organizational problems. The customer and the environment then remain

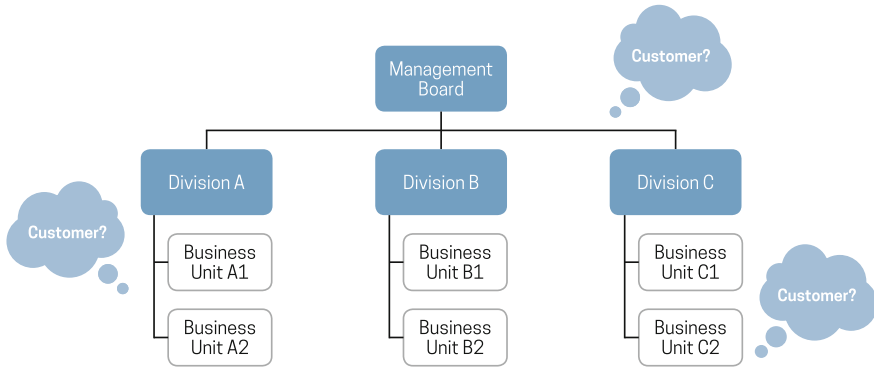


Fig. 13.1 The environment and customers are missing in a typical organizational chart

only a “nuisance” in the organization’s attempt to restore the internal balance in its political games.

In contrast to this purely inside view, the VSM offers us an image of organization that is fundamentally oriented toward and linked to the environment. The entire system consists of both the environment and the organization. Healthy and viable organizations can only exist in unity with their environment (Beer 1994: 163ff). The environment is the basis, on which an organization lives and flourishes, and with which it is in a constant exchange. The environment must then always be a part of the organization. An organization without environment does not make sense. This is the underlying philosophy of the VSM, and this differentiates it from many traditional images of organizations.

According to the VSM, the design of organizations does not mean drawing lines and shifting boxes around in the organizational chart, but rather to design and arrange structures, processes, and resources in such a way that the environment and the organization are aligned to each other and can form an ecosystem. To put it alternatively into the language of Ashby’s Law: designing organizations means organizing the organization’s *eigen*-variety in such a way that it can best match and process the environmental variety. Only then can viable ecosystems and communities emerge with the customers. The **formation of these ecosystems** should be the beacon and benchmark for organizational design and transformation processes.

This has implications for **reorganization processes**: every new organizational structure must be evaluated in view of its requisite *eigen*-variety. It must prove that the new organizational structure allows an organization to process better complexity and form more vibrant ecosystems than the current and any other structure. This approach has a positive consequence for reorganization processes: whoever can show that the new structure better processes the environmental complexity than the old one, and will have fewer difficulties to prove that the new structure is not the result of a political internal power game but benefits the entire organization. This will increase the acceptance of the new structure.

13.2 The Center of an Organization is Its Purpose

Looking at organizational charts of various organizations, one may be curious as to what the core and center of the organization are. In the images that many organizations draw from themselves, the purpose and objective of the organization do not become transparent.

In the VSM perspective, we, however, find a clear distinction: we have processes and activities that are directly related to the purpose (i.e., the product), and those that “only” support these processes. The organization rests on the foundation of the processes that produce the organization’s purpose – the systems 1. Hence, they should be at the center of the organization’s focus. As mentioned earlier, this is also the implicit message behind the numbering logic of the VSM. The system 1 processes are the basis for the organization, and the rest of the organization is built “only” on and around these **system 1 processes**. They are only there to support the systems 1 and to ensure the long-term viability of the organization.

This is in contrast to the standard organizational chart, where functions hang at the same height as if they were on a clothing line without any differentiation. A better picture than the organizational chart would be to group all functions and units in concentric circles around the purpose and customer (see Fig. 13.2).

Thus, before we start any reorganization, we should focus on answering the following questions: What are the processes and units that produce the purpose of the organization? How can we ensure that they are and remain in the focus of the entire organization? And, how should the remaining processes and functions be designed so that they support best the processes that produce the purpose? Only if these questions are clearly answered and kept in mind, one should proceed with the reorganization.

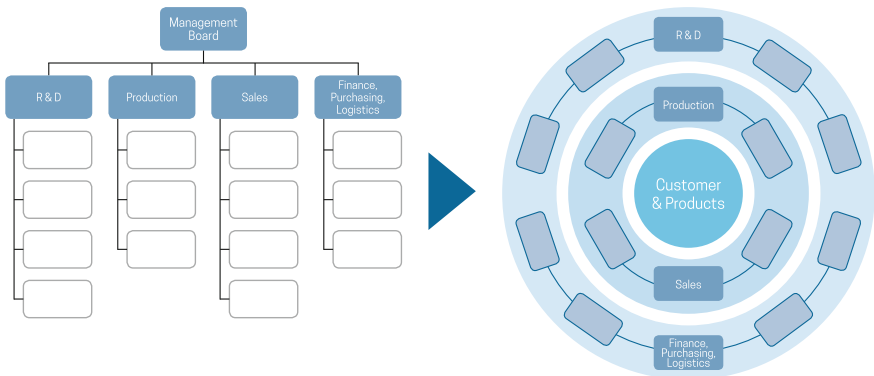


Fig. 13.2 Comparison of the standard organizational chart with a product- and customer-centered chart

13.3 Organizational Depth Instead of Hierarchy

When one reads management books on leadership and organizations, one can observe a certain ambiguity on how to deal with the phenomenon of “hierarchy”. On the one hand, one would want to live without it and proposes “flat” organizations, in which conflicts are solved through shared values, identities, and much communication; on the other hand, we observe that in reality organizations and executives do not follow this advice and continue working in hierarchical structures. “Hierarchy” as an organizational operating mode seems to be more tenacious than one thinks. The reasons for having hierarchies seem to be more profound than simply being a matter of choice, power, a lack of imagination, or organizational preference.

This ambiguity can be resolved by using the VSM, which sheds new light on what “hierarchy” can mean and why it is necessary. One reason as to why many management thinkers want to abolish hierarchy seems to stem from the observation that hierarchies have adverse effects on the information flow and decision-making within the organization (see also Section 11.3). Hierarchies appear to hinder organizations in their adaptability to their environment. However, do these problems mean that hierarchy as an organizational mechanism is bad altogether or is the problem not rather malpractice and misuse of this mechanism? Would the call for the abolishment of hierarchies not result in throwing out the baby with the bathwater?

Stafford Beer and the VSM point us to another perspective and interpretation of hierarchies: first, the introduction of levels when viewed from a systemic perspective is first and foremost a measure of organizations to promote deeper unity and cooperation among the parts of the organization.¹ As we pointed out earlier, coordination and synergies require a different perspective on the organization: the parochial view of the individual units does not suffice anymore, one needs to assume a holistic perspective on all units. Even basic democratic organizations need decision-making processes and bodies that assume a higher level perspective and require the decision-makers to view their organization in its entirety and not just in its individual elements. To put it more pointedly: **Hierarchy systemically understood is a consequence of cooperation and community ... and not their opposite.**

Hierarchies do not only coordinate and forge greater unity, but they secondly also add to the organization’s *eigen*-variety. At this point, we should perhaps better replace hierarchy and all its negative connotations by the concept of “**organizational depth**”. For the mastery of complex situations such as IT security architectures, military operations, and protection mechanisms for nuclear power plants “depth” has become an important factor: in so-called “defense-in-depth” strategies one uses multiple layers to fend off threats. If one layer fails, there is another layer to prevent any intrusion and to buy time to organize a defense. This is a bit similar to organizations: organizations also need depth, that is structures that provide

¹ Similar to any other instrument, the way it is used then decides whether its purpose can be achieved.

“breathing time”, stability, coordination, support through providing additional emergency resources, and new ideas in the view of changes in the environment.

If one studies the logic of the VSM, one realizes that the so-called “higher” functions are there to provide this kind of “depth”, i.e., the support to the operational functions at the “front” of the environment such as reinforcements of resources, ideas, or overview (similar Thompson 2003: 59). It is no coincidence, as mentioned before that the VSM starts counting the systems function with the operational units. Every “higher” system function and recursion level exists to process **the variety that cannot be processed adequately by “lower” functions and levels**. If we turn the organizational chart by 90° and overlay it with the VSM logic, we can perhaps better recognize the specific value of hierarchical levels: the **lower levels provide closeness** to the environment, the **higher ones depth, redundancy, and maneuverability** if the lower levels fail (see Fig. 13.3).

As we already said earlier, the **higher level structures exist to provide additional eigen-variety** to the operational functions and units on the market front. They are an instrument to create a space of calm and concentration² within the stormy changes in the markets, which allows reflection and sound decision-making, without which the organization could become soon out of control. Hierarchies are there to ensure that organizations do not become “headless chickens” in the event of changes and crises. So, the purpose of hierarchies is to increase an organization’s capacity (or *eigen-variety*) to process complexity and not to decrease it.

We are thus in a position to suggest that even the opposition between “hierarchy” and “flat organizations” might be misleading. Organizations most probably need both organizational modes, as we have already discussed in the chapters about system 5 and **the hierarchical and heterarchical mode** (similarly Schwaninger 2006: 32f). Being able to operate and use both modes simultaneously and to switch

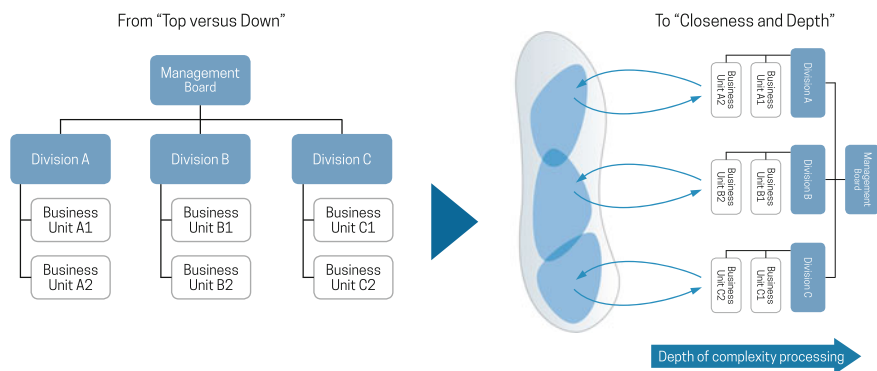


Fig. 13.3 From the “top-down” in the organizational chart to the “closeness-depth” paradigm in the VSM

² It is an interesting phenomenon that the offices and floors of the top executives tend to be kept quiet and calm intentionally.

between both modes seems to be a key competency for organizations. Not one alone, but both modes together give an organization the necessary *eigen*-variety to adjust to different situations. In some situations, hierarchical decision-making is necessary, especially if time is scarce (see Luhmann 2007: 146); in other situations, the heterarchy is better suited, for instance, in situations when organizations need to change their strategic and fundamental orientation. The key issue is thus **not an “either-or”** but rather when and how both modes, hierarchy and heterarchy, are applied correctly. Our discussion about system 5, the algedonic channel and the necessity of the metasystem to focus on the systems 1 also showed us that the top needs to involve the bottom. In volume 2, we will discuss this aspect more in-depth and what it implies regarding our understanding of leadership.

13.4 Automation, Autonomy, and Viability

Leading people and organizations is an exhausting and daunting task for many executives and managers. Nothing would be better if we could solve and automate all the issues and problems with computers and through algorithms: why cannot we actually automate an organization?

“Organization as a (deterministic) machine”—Early on from his publication activities, Stafford Beer (1967: 216ff; 1994: 165) feared that a mechanistic approach would not solve the challenges an organization is facing and that it would neglect the specific competency required for organizations, namely, to adapt continuously to the unknown and new. The control of the yet unknown and the creation of the new can only be achieved by self-learning processes that allow the recalibration of the system.

One could argue that the new and unknown only concerns the upper levels of an organization and that the lower operational levels could be treated as machines without hesitation. This view underestimates the challenge that the new and unknown appear at every level of the organization: every customer order already confronts an organization with possibly yet unknown factors. Thus, at every (!) level self-learning control and adaptation mechanisms are needed—this is one of the key messages of the recursivity theorem of the VSM.

Hence, the desire to “automate” the entire organization and treat, especially lower levels as “machines” are neither possible nor desirable. Too much emphasis on efficiency, routinization and standardization can lead to the depletion of companies, robbing them of their “soul” and creative potential. A CEO once expressed his surprise of how creative and active his employees become once they leave the company through its gates at the end of the day and week. This is not surprising: whoever treats his or her employees just as machines, production or cost factors, FTEs, or human “resources” does not tap their true potential: adaptivity and creativity. Organizational design, hence, also means finding ways to address and activate the “brains”, and thus, to increase the autonomy on all levels—this is a central message of recursivity in the VSM (see Chapter 10).

Today's emphasis on empowerment, self-learning, and self-governing agile team structures so as to increase the flexibility of the organization reflects what is also expressed with the VSM. For Stafford Beer, the more appropriate guide to understanding an organization is **the autonomously living organism** that goes beyond the purely vegetative functions and also develops creativity, self-consciousness and a mind. It does not come to a surprise that for Stafford Beer, the human brain and central nervous system were early on an important source of inspiration for the VSM (Beer 1994, 1995).

If one views the VSM from a greater distance, one can recognize how the VSM in its current graphical form was inspired. Systems 1 correspond to the organs; the sympathetic and parasympathetic were interpreted by Beer as system 2 and 3*. System 3–5 together represent the brain and some of its major functions, such as processing the internal and external motoric-sensory impulses and the cerebral cortex as the place where decisions are made. Whether Stafford Beer's original interpretation still holds in light of modern neurosciences can be rightly questioned, but at least it led to an interesting model regarding the functioning of organizations.

13.5 Organization—Not an Algorithm

The VSM reminds us furthermore that organizations are **communication and information systems**. Managing organizations thus also requires mastering the instruments of good and effective information and communication. This is, however, not all that the VSM requires us to see and could even be misleading if we apply an understanding of communication and information that is too technical. Organizations are more than that: they are systems that are controlled by different mental models, worldviews, and languages (see Fig. 13.4).

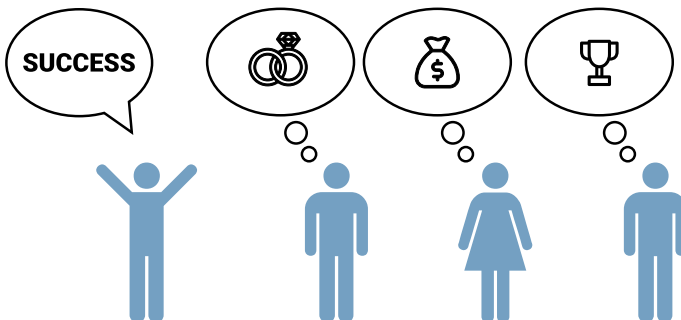


Fig. 13.4 Even for so simple terms such as “success” different interpretations exist in organizations and need to be reconciled

Employees working at the interfaces to the environment (e.g., sales) talk and think in different languages and terminologies and have a different perception of what is “real”, “important”, or a “key success factor” than those working in internal functions. Alternatively, just let us consider the various system functions: employees in a system 4 function express themselves differently and have different priorities than those working in the operational metasytem such as in system 2, 3, or 3*.

Thus, an “organization” is nothing solid, like a building, even if it sometimes may appear so. Organizations are networks of different control models, worldviews, and languages that are constructed in various places in an organization and that need to be continuously adjusted and connected to each other—otherwise, everyone is building upon his or her reality.

For organizations, not to become towers of Babel that crush under the mass of different languages, models, and perceptions of reality, organizations must continuously work on a common language, control model, and understanding of what “reality” for everyone is. **Organizations are a continuous process of constructing a mutual understanding and meaning and of translating between different languages and perceptions.**

“We need to create a common understanding!”—This call is often voiced, especially during change processes and demonstrates the need to have processes that help translate between different worldviews and construct a common one. Organizations depend on shared sensemaking and perspectives; they are not an algorithm that can be mastered by a management information system. At the heart and center of organizations (in particular, in the metasytem), we find **discourse and debate as one of the key adaptation processes of organizations**, and this is another central message that we can derive from the VSM.

13.6 Organizations Have a Structural Logic

Quite often as consultant one is asked by executives and employees, “Are we the only one to face these problems or do other organizations also face them?” Since organizations and their specific situations vary, it is in general difficult to respond to this question. As consultant one has already seen similar problems and challenges, but can one generalize them?

The contingency theory (e.g., Burns and Stalker 2013, ©2001; Lawrence and Lorsch 1967) made clear that the design of organizational structures cannot be reduced to a limited set of factors and parameters. There exists no “ideal” organizational (chart) structure since the structure itself depends on many environmental factors and consequently varies significantly. On the other hand, one can observe that organizations although being different, often face similar issues and are exposed to the same kind of tensions and problems.

Two generalizations helped Stafford Beer to overcome the hurdle of differing circumstances, in which we find organizations: by using the concept of “complexity” (or “variety”) and “system function”. All organizations face the same problem regardless of their differences: how to process complexity? By using “system function” as the building block for organizations, Stafford Beer was then able to reduce the variety of different internal processes to a limited set of specific types of processes. The allocation of budgets, production slots, access times to IT servers, employees, raw materials, and infrastructure are all different regarding the content, but they are all identical when it comes to their systemic function for the organization, namely, the allocation of resources. This type of generalization enabled Stafford Beer to work out a general model that can be applied to all types of organizations.

If we take a closer look at the VSM, we see that the system functions as identified by Stafford Beer and their arrangement are no coincidence. They are instead the logical consequence of different types of complexity that emerge in the process of organizing (s. Table 13.1). The system functions are, hence, a necessity if organizations should function and become viable. No organization can work without these functions.

Table 13.1 Complexity types and corresponding system functions

Types of complexity	Key systemic tasks	Systems function
Complexity of the environment , for which the organization wants to create a benefit and fulfill a purpose	Processing the relevant environmental complexity and producing the purpose of the organization	Operate
Complexity that results from the parallel existence of several operational units that should cooperate	Coordinate between the units and reduce conflicts	Coordination
Complexity resulting from the objective to create benefits from cooperation (synergies)	Planning and allocation of resources	Integration, controlling of resources, and creating synergies
Unforeseen complexity resulting from the operational activities of the organization	Early identification of problems and optimization of the operational activities	Audit
Complexity resulting from the wider environment , in which the organization operates and the yet mostly unknown future	Anticipation of developments and trends in the wider environment and future	Innovation and development of new strategies
Complexity resulting from the necessity to decide between maintaining the current state and changing to a new one and thereby ensuring coherence	Development of decision-making principles and rules	Long-term policies, norms, principles, and policies

Before you continue reading, I suggest that you compare this table with your own activities and experiences in your own organization. As you might see, all the essential aspects of an organization are addressed, even if still on a very general level. In volume 3, we will get much more into detail and see how the various corporate functions such as finance, sales, and procurement can be described more specifically in the VSM.

13.7 “Don’t Take It Personally”

The structural logic presented by the VSM has many advantages, especially when managing people in organizations. Many problems and issues in organizations today are very often and quickly attributed to the individual, his or her character, personality, competencies, and weaknesses. However, often, these conflicts do not always have their cause in the individual but rather in the specific function that this individual must perform for the organization.

Think about the problems of a central coordinating unit or an auditor, whose problems such as the ones described in Chapter 4 have the origin, instead, in their function and not so much in personal incapacities. Organizations have to become aware that problems, conflicts, and challenges are not always related to people, but to the organizational tensions and conflicts, in which people have to operate.

Often it is **the structures that hinder people from becoming effective**. And, not too seldom, rather the dysfunctionalities in the structural design of the organization cause individuals to become less effective than personal failures and weaknesses. This phenomenon is quite well-known to HR experts when people are recruited or transferred to new jobs: some overperformers suddenly become quite average or even underperformers in their new position to everyone’s surprise. Conversely, employees who were not performing well, flourish in new positions or a different organizational unit. Hence, the productivity of people not only depends on them as individuals but also on the organizational setting, in which they are working. The constraints on the individual’s performance due to systemic dysfunctionalities in the organizational structure will be the specific focus of volume 2.

The VSM thus suggests, as Espejo and Reyes (2011: 87) remarked, to view not so much the individual, but instead organizational functions and roles as the basic elements of organizations. This reflects a phenomenon that has been known for a long time: individuals adopt different personalities when working for organizations compared to their private lives. Barnard (1968) coined the term “organization men” for this phenomenon, whereby the exigencies of the organization and its structural logic determine people’s behavior. Many negative behaviors have the root not only in personal traits but rather in structural pathologies in the organization. It is also the structures that make individuals sick.

For many years, a utility company tried to overcome conflicts between two units with many interventions by cultural and conflict management consultants, but this did not help. A closer analysis based on the VSM revealed severe structural

dysfunctionalities: both units originally formed one unit. For unknown reasons, this unit was split up, where the first unit took over the operational processes and the second unit was responsible for all metasystemic functions of the first unit (thus, it was called “planning”). Whereas the second unit still considered itself as the metasystem of the first unit, the first unit now independent started developing its own metasystem; after all, it was now an autonomous unit according to the organizational chart. Organizations are like living organisms: when a unit loses its head (i.e., the second unit), it will then try to substitute it by forming a new head. Therefore, the split into two units resulted in two heads or two metasystems that wanted to control the same operational processes.

As we can see from this example, the source of the conflict was not so much to be found on a personal level, but rather on a structural-systemic one. One needed to adjust the organizational functions in both units and the expectations on what tasks and responsibilities each should perform to solve the conflicts at its roots. This does not mean that personal motives and personalities are not implicated, but not always. **Conflicts can also result from structural tensions** or, even worse, dysfunctionalities (see volume 2) and the way how the organization has been designed to process complexity. In these incidents, conflicts need to be addressed at the structural level.

13.8 Organizational Images—Comparing the VSM to Other Representations of Organizations

We all use different images and models to describe organizations: they all fulfill a specific purpose, but also have their weaknesses. At the end of this chapter, we will compare the most familiar images of organizations with the VSM, to understand how the VSM can complement these images.

13.8.1 The Organizational Chart

The most commonly used image of organizations is the organizational chart (see Fig. 13.5) because it provides a fast overview of the organization, allocation of tasks, responsibilities, and employees. It structures activities according to factual issues (e.g., products, markets, and technologies) or processual similarities (e.g., procurement, finance, and HR). In addition to that, the organizational chart provides a first snapshot of the decision-making pyramid and the distribution of decisional power in the organization. It also serves as the official portrait of the organization to the external environment.

We have already identified some of the problems with this image; we just want to reiterate a few. One of the key problems is its brevity: it reduces the organization to accountability (or rather: “who is to blame?”) and power. Many processes,

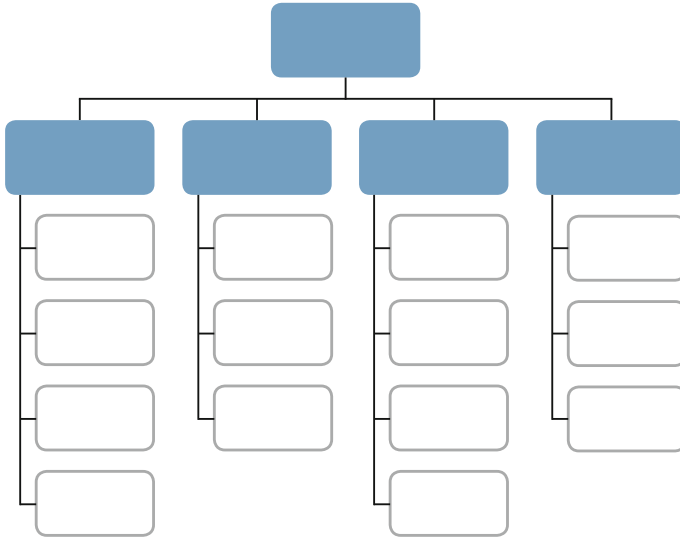


Fig. 13.5 Organizational chart

however, that are important for the viability of an organization, such as sensors, coordination instruments, creativity, or normative aspects, are missing.

Another disadvantage is that it does not become transparent how the “boxes” work together. Most of the activities in organizations happen laterally and not vertically as the reporting lines in the organizational chart would have us believe. This also has implications regarding the accountability of people. The responsibility for a certain task is more distributed than the organizational chart suggests.

Furthermore, in an organizational chart, it does not become transparent that an organization is oriented toward the environment and processing external complexity. In its somewhat static appearance, it does not make clear what organization also means, namely, a **constant processing and organizing of incoming environmental complexity**.

The organizational chart is an important instrument, no doubt, but the VSM can counterbalance some of its shortcomings. The VSM makes us aware of how multifaceted organizations are, what the fundamental processes, information channels, and what the control loops for an organization are. It also reminds us that organizational design should always start with the question as to how the environmental complexity should be processed best. As we will see in the third volume, the VSM is a valuable tool to make the right decisions regarding the organizational chart structures.

13.8.2 Process Maps

Another perspective on organizations becomes available through the inclusion of the time dimension: the process chart (see Fig. 13.6). The advantage of process charts is that they offer a more detailed view of how processes and activities are connected to each other and what type of interface must be considered.

However, the temporal sequence of processes is only one aspect of organizations, the other issue is, whether one has sufficient resources and competencies to address a problem or, in the language of Ashby’s Law, **requisite variety** to process variety. It is not sufficient to ask, whether one has all the required processes in place and whether one has designed them efficiently. Beside the process flow, another important question is, whether one has the **resources and competencies**, so the requisite *eigen*-variety, to deal with all the issues flooding the organization for each process step. This is the question the VSM asks...

Official process charts are often silent on this question, and this is the reason why employees sometimes resort to inofficial procedures and tricks to solve an issue because the manuals and process descriptions do not provide an answer (Orr 1996). A complementary model to process maps such as the VSM reminds us to ask, especially, whether all processes comply with Ashby’s Law in terms of requisite variety.

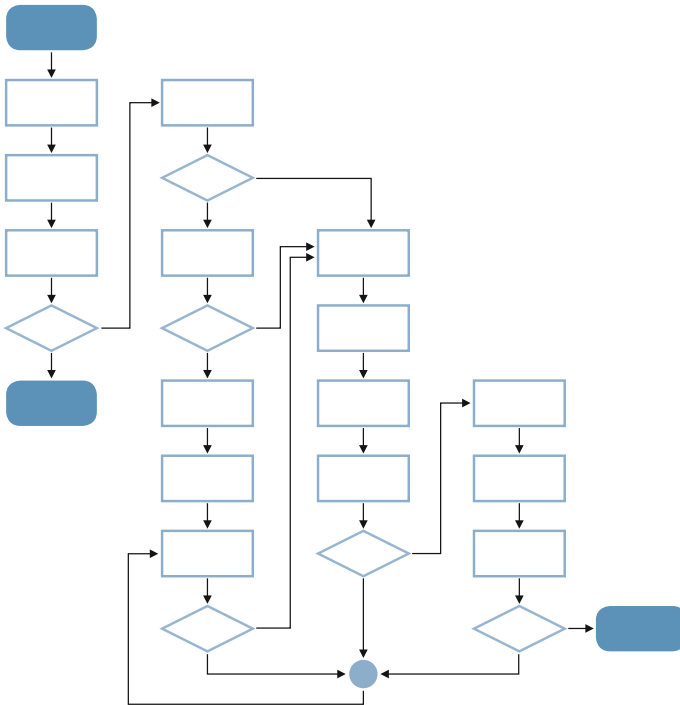


Fig. 13.6 Process chart

Another problem of process maps and flowcharts is their reductionism: they do not draw our attention, unlike the VSM, to the fact that many other dimensions influence the performance of processes, such as shared values, norms, and languages or the necessity for every process to have a system 3* and system 4 function. Every process creates an exception requiring a separate audit and improvement mechanisms, and every process needs to adjust to new circumstances, and hence needs new ideas.³

The VSM thus offers us a more holistic image of the “functioning” of organizations and processes than the pure process flow suggests to us.

13.8.3 Networks

Besides the above mentioned popular images on organizations, one emerged especially from the 1990s onward: the image of the interconnected and informally structured organization, which does not replace the traditional hierarchy, but should compensate for its deficits. The image of networks (Fig. 13.7) reminds us that decisions are often not taken at the lonely top of a hierarchy, but that they emerge through discussions and exchanges between people within an organization. The decision taken by the formal hierarchy is then just the end point of a lengthy cooperation and reflection process of many on what course to take.

The challenge with the network image is that networks do not describe sufficiently, how networks are operating, i.e., **what roles and functions are needed** and



Fig. 13.7 Working in networks: a popular and modern image of organizations today but how does it work? (© Fotolia/stock.adobe.com; artist(s): VAlex)

³ Continuous improvement process methodologies that fulfill these functions are thus not an add-on but a necessary systemic element from the VSM’s perspective.

how the elements of a network must work together. Being connected means just that: one is connected to someone else, and even the intensity of the connection provides only limited information about the real role of a node in a network. The vital question, however, is how (!) a network is controlled, managed, and held together and this includes the question of its ethos, values, and principles. In this regard, the VSM complements the network image by drawing out attention to the internal system functions of a network.

Summary

Some of the key messages of the VSM are as follows:

- Viable organizations must enable the formation of ecosystems. Core and the basis of any organization are the activities and units that produce the purpose of the organization. They must be at the center of the organization.
- Hierarchies should be used as an organizational instrument to facilitate the processing of complexity and increase the maneuverability and depth of the organization.
- Organizations should not focus only on gaining efficiency and automation, but also on increasing the level of self-organizing and creative adaptation on all levels.
- Organizations are systems that depend on the exchange and mutual adaption of languages, control models, perspectives, and perceptions of reality.
- Despite differences in the environment, resources, and competencies, all organizations need to have all the systemic functions and information channels developed as described by the VSM.
- Conflicts in an organization are not only the consequences of interpersonal issues but can be the result of structural and systemic dysfunctionalities. Not only people but also organizational structures influence the behavior and motivation of employees.

References

- Barnard, C. I. (1968). *The functions of the executive*. Cambridge: Harvard University Press.
- Beer, S. (1967). *Cybernetics and management* (2nd ed.). London: English Universities P.
- Beer, S. (1994). Towards the cybernetic factory. In R. Harnden & A. Leonard (Eds.), *How many grapes went into the wine. Stafford Beer on the art and science of holistic management* (pp. 163–228). Chichester ... [etc.]: Wiley.
- Beer, S. (1995). *Brain of the firm* (2nd ed.). Chichester, New York: Wiley.
- Burns, T., & Stalker, G. M. (2013). *The management of innovation*. Oxford, Milton Keynes UK: Oxford University Press, Lightning Source UK Ltd. (©2001).

- Espejo, R., & Reyes, A. (2011). *Organizational systems: Managing complexity with the viable system model*. Heidelberg, New York: Springer.
- Lawrence, P. R., & Lorsch, J. W. (1967). Differentiation and integration in complex organizations. *Administrative Science Quarterly*, 12(1), 1–47.
- Luhmann, N. (2007). Die Knappheit der Zeit und die Vordringlichkeit des Befristeten. In N. Luhmann (Ed.), *Politische Planung. Aufsätze zur Soziologie von Politik und Verwaltung* (5th ed., pp. 143–164). Wiesbaden: VS, Verl. für Sozialwiss.
- Orr, J. E. (1996). *Talking about machines: An ethnography of a modern job*. Ithaca, N.Y.: ILR Press.
- Schwaninger, M. (2006). *Intelligent organizations: Powerful models for systemic management; with 6 tables*. Berlin, Heidelberg, New York: Springer.
- Thompson, J. D. (2003). *Organizations in action: Social science bases of administrative theory*. New Brunswick NJ: Transaction.

Not an Epilog, but the Point to Set the Sails ...

The viability of organizations is not a side topic, neither on the individual nor the societal level, we said at the beginning of this volume. Our wealth, productivity, and well-being depend on viable organizations. This book intends to shed some light on what “viability” for organizations means, how it becomes constituted and what it implies for how we manage organizations. As author, one hopes that this volume will achieve its objective at least in its essentials and the reader will feel enriched by what he or she has just read.

Clearly, some issues might be still open for the reader: the VSM touches on so many different aspects of organizational life that it needs more than one volume to explore all the facets. The VSM also presents us with such a novel perspective on organizations that for some readers this book might even raise many new questions, especially to those who are new to the VSM. In this regard, **volume 1** can only lay the foundations and be the starting point for a more in-depth analysis and discussion on the viability of organizations.

Thus, we have now reached the interface to volume 2 and 3: in **volume 2**, we will turn our attention more specifically to the **diagnosis of organizations**. What are typical “dysfunctionalities” that can occur in organizations? The objective of volume 2 is to introduce us to the most common dysfunctional patterns. Based on them, we will then be able to understand more accurately the hot spots in organizational life such as the necessary balances between the system functions, the question of centralization versus decentralization, the challenges that await an organization during its life cycle, and how hierarchies should function properly. However, improving our diagnosing capabilities is not the only benefit: the discussion of these dysfunctionalities will lead us to even deeper insights into how organizations function.

In the **third volume**, we will return to the standard model and terminology that we use for describing **organizational structures**, and particularly to the organizational chart, which is the most commonly used image. We still need to understand, how we can relate the organizational chart to the VSM. How do we find the

organizational chart in the VSM and vice versa? This will be one of the guiding questions of volume 3. There, we will learn how the standard corporate functions such as production, logistics, and purchasing operate from a systemic perspective, and how and where we can find them in the VSM. We will also see how jobs and positions need to be designed, how organizational chart structures need to be modeled, and how other issues such as outsourcing or matrix constellations can be addressed using the VSM logic. Finally, we will shed some light on reorganization processes and how the VSM can help us to set up an effective and sense-making transformation process from the old to the new organization.

Each end has two sides: an end is the final point of a process, but at the same time the starting point for a new one. The end allows the future to begin. In this sense, having reached the end of this volume, we are now ready to start an even more far-reaching journey into the functioning of organizations. We have just set the sails and left the harbor; many new and exciting insights are lying ahead of us... do not miss them! Welcome on board!



(© Fotolia/stock.adobe.com; artist(s): Alexander Nikiforov)

Index

A

- Accountability, 79–81 *See also* responsibility
- Adaptability, 3, 9, 64, 117, 121, 150, 159, 170, 172, 175, 214, 216, 218
- Adaptation, 16–18, 29, 104
- Agility, 52, 64, 67, 102, 170, 177–181
- Alertness, 100–101
- Algedonic channel, 154
- Ambidexterity, 115, 121
- Amplifiers, 12–15, 45
- Ashby, Ross, 8
- Ashby's Law, 8, 15, 43, 45, 60, 89, 98, 119, 143, 150, 159, 212, 223
 - diversity, internal, *see* *ibid*
 - dynamic, not static equilibrium, 16–18
 - examples, 12
 - rate of innovation and internal change, 115
 - responsibility as awareness of Ashby's Law, 159
- Attenuators, 12–15, 45, 80
- Auditing dilemma, 88–89
- Auditing, *see* system 3*
- Autonomy, 68, 172, 217 *See also* self-determination

B

- Blindness, operational, 85
- Boss-function, 141
- Boundaries, environment, *see* environment
- Boundaries, organizational, 2, 4, 40, 78, 81
 - identity, 128
 - innovation and need to open boundaries, 106
- Buffer, temporal, 78
- Business Mission, 130, 131, 141

C

- Chandler, Alfred, 165
- Change, 29, 56, 87, 104, 105, 117, 121–123, 145, 212, 213
 - Change, institutional space for, 122
- Cognitive dimension of organization
 - changing control models, 180
 - changing minds, 177
 - convergence of perspectives, 122, 218
 - different perspectives, generation of, *see* *ibid*
 - multidimensionality, 189
 - perception and perception patterns, 97, 101, 102, 218
 - reality, perception of, 101, 115, 118, 122
 - relevance, defining, 97, 115
 - translation, the need for, 189
- Cohesion, 64, 140, 154, 156–157, 172
- Collective knowledge, 66
- Common picture and focus, 114
- Communication problems, 188, 190
- Complexity
 - matter of choice, 6
 - measures, 8
 - opportunity for organizations, 7
 - reduction, 66, 72, 73
 - types of complexity to be processed by organizations, 219
- Conant–Ashby theorem, 50
- Confidence-building measures, 66
- Confidentiality, 137
- Conflicts, 70, 141, 220–221
- Conscience, 158–159
- Contingency theory, 218
- Controlling, 44, 49, 109

- Controlling unit, support for the management, 54
- Control models, 22
- Coordination, 23, 55, 63, 65–67, 69, 71, 82
- Coordination, limitations of, 77
- Coordinator's dilemma, 68
- Creativity, 104–105
- Culture, 66, 85, 106, 108, 136
- Customer, 40, 55, 71, 106, 158, 161, 187, 211
- D**
- Debating culture, need of, 114, 121–123, 136, 151, 192, 217–218
- Decentralization, 63, 179
- Decision-making
- Ashby's Law, 133
 - competency versus legitimacy, the problem of, 52–53
 - different perspectives, need of, 138–140
 - formal decision-making rules, the need of, 141
 - majority rules, 141
 - openness and undecidability of decisions, 129
 - past decisions, laboratory for decisions on their future effects, 137–138
 - questioning, function of, 138–140
 - standing by decisions, 141
 - validity and definiteness, formal requirement of, 132
 - vantage point, the need to create, 130
- Delegation, 178, 179–181
- Diagnosis of organizations, 15, 143, 213
- Different perspectives, generation of, 85, 101–102, 103, 105–106, 138–140, 152
- Diversity, internal, 105–106, 140
- Drucker, Peter, vii, viii, 39, 40, 55, 121, 138, 141, 161, 170, 173, 178, 185
- Dynamic capabilities theory, 13
- E**
- Ecosystems, 55–56, 211–213
- Eigen-variety, 8, 15, 49, 99, 104, 212
- End in itself, danger of becoming, 62, 89, 102, 161
- Environment
- boundaries, 71
 - interdependencies, 71
 - primary and secondary environments, 42, 161
 - segmentation, 71
 - wider environment, 97
 - wider environment and future, 28, 94
 - wider versus partial environments, 93
- Equilibrium between environment and organization, 140
- adaptation, mutual, 9, 104
 - Ashby's Law, 45
 - bi-directional relationship, 17, 40, 105
 - cognitive dimension, 43
 - communication problems, 45
 - dynamic, not static, 16–18
 - exchange process, 40
 - listening, importance of, 97
 - meeting platforms with environment, 43
 - multidimensionality of equilibrium, 45
 - sensors to the environment, 44, 97
 - translation, 44, 187
 - transparency, lack of mutual, 43
- Examples and anecdotes, their function in organizations, 144–145
- Experience, the function of, 132
- F**
- Formal organization, 107–108
- Future, 28, 99–109, 137–138
- alertness, 101
 - chance, not only threat, 104
 - hidden in organization, 100
 - known versus unknown future, 94
 - organization's eigen-variety, 104
 - predicting, 99
 - scouts and guards, 100
 - sensors to the future, 100–101
 - tangible, need to become, 118
 - voyages, instrument to reduce unknown future, 103
 - organization as origin of the environment's future, 105
- G**
- Groupthink effect, 139
- H**
- Heterarchy, 134, 136–137, 216
- Hierarchy, 60–61, 119, 134, 136–137, 154, 165, 181–183, 213, 214–216
- I**
- Identity, 66, 116–117, 144–145
- Informal organization, 101, 107–108, 135, 142
- Informal organization, advantages and disadvantages, 67–68
- Information, 92, 185–192
- calibration of sensors, 44
 - evaluation and interpretation of information, 97, 100
 - extra capacity of information channels, 190

- information deficits, 27, 83, 86–87, 97, 99, 130, 150, 188
- information flood, 190
- information network, need to create, 134
- information not reaching its destination, problem of, 100, 191
- network, need to create, 192
- sensors, 44, 95, 97, 99, 157, 199, 200
- Innovation
 - different perspectives, the need to generate, 105–106
 - prototyping, required to make future tangible, 118
 - social process, 106–108
 - freedom, required, 121
- Insight, the need to create, 49
- K**
- Knowledge organizations and willingness to change, 121
- L**
- Learning, 16–18, 49, 99, 176, 216
- Listening, 97, 102, 136, 156–157
- Luhmann, 45, 66, 129, 188, 216
- M**
- Management-by-objectives and self-organization, 170
- Management (of system 1), 22, 53
 - adjustment of variety, 51
 - higher order perspective, the need to create, 130
 - responsibility, 46
 - composition, 51–52, 119
 - interfaces between management units, 72
 - operation, interaction with, 23
 - regulation tasks, management being relieved from by regulatory center, 53
 - requisite eigen-variety, 22, 49, 50, 52
 - systemic tasks and purpose, 47–51, 214–216
- Management levels, logical, 34, 214
- Marketing and PR, role of, 43
- Meta-system
 - composition, 119
 - systemic tasks and contribution, 25, 60, 214–216
 - hierarchy, 60–61
 - internal interaction, 149
 - new perspective, the need to create a, 60
 - meaning of meta, 60
- N**
- Network, effects on complexity, 72
- Network, need to create, 63, 101, 122, 192
- Network, organizational image, 224
- O**
- Objectivity and neutrality, 130, 151
- Operation, 54, 72, 84, 87
- Operations room, 29, 121–123
- Organization
 - complexity, basis of existence, 6
 - consisting of ecosystems as its building blocks, *see* ecosystems
 - customers, *see* customers
 - diagnosis of, 15
 - different perspectives, generation of, *see* *ibid*
 - environment, relation to, *see* equilibrium environment and organization
 - foundation, 39–40
 - images, *see* organizational images
 - origin of the environment's future, 105
 - information and communication system, 185, 217
 - organizational depth vs. hierarchy, 214
 - processing of variety, *see* *ibid*
 - purpose, 5, 39–40, 55, 158, 160–162, 213, 222
 - structures, 108, 218, 220
 - traditional and new business, structuring, 109
 - transparency to itself, 52, 53, 67–68, 171–172
- Organizational chart, 142, 221
 - advantages, 52
 - design, 15, 56, 72, 181–182, 213
 - disadvantages, 52, 211
 - product and customer-centric perspective, 213
 - transparency for the Organization, 52
- Organizational images, 221–225
- Overview, need to create, 22, 48
- P**
- Past, organizational role of, 137–138
- Plans
 - coordinating activities in the factual, social, and temporal dimension, 53
 - devices for self-organization, 54
 - embodiments of the resource bargain, 79
- Power, 60, 81, 89, 92, 120, 127, 142, 153
- Power and information, 191–192

- Process maps and the VSM, 223
- Product, generation of, 40, 55, 161
- Purpose, 158, 160–162
- R**
- Randomness, positive function, 86, 103
- Recruitment and promotion, 49, 106
- Recursion levels, 169, 171, 172, 174, 187, 197, 199, 207, 209, 215
- Recursivity, 165–169, 177, 216
 - counting recursion levels, 182
 - delegation, 181 *See also* ibid
 - divisionalization, 166
 - embedding of meta-systems, 173–174
 - functional similarity, 166, 176
 - hierarchical vs. recursion levels, 181–182
 - inter-recursive channels, 175–177
 - self-organization, *see* ibid
 - temporal recursivity, 177–178
 - transparency between recursion levels, 171–172
 - vertical differentiation, 165
- Reflection, 92
- Reflection, joint, 114, 121–123, 122, 123, 130, 218, 224
- Reorganizations, 15, 56, 64, 72, 145, 212, 213, 219
- Reporting, 80, 92, 121, 150
- Resource
 - meaning in the VSM, 79 *See also* eigen-variety
- Resource bargain. *See* system 3
- Resource-based view, 13
- Responsibility, 81 *See also* accountability
 - Ashby's Law, 158–159
 - not automatically given, 80
 - stabilizer for organizations, 80
 - standing by decisions, 141
- Rules and regulations, 61–62, 65–66
- S**
- Self-determination, 4, 169–170, 172, 216–217
 - See also* autonomy
- Self-organization, 53–54, 68, 83, 87, 88, 156, 169–170
- Self-reflection, 88, 92, 123, 130, 174, 177
- Simulations and scenarios, 98
- Social spaces, 24, 66, 101
- Stability, 16–18, 78, 117
- Storages, systemic function of, 78
- Stories, role of, 144–145
- Strategy-making, 93, 114, 118, 123, 157
- Subsidiarity principle, 63, 170
- Suggestion boxes, 87
- Survival of the fittest, meaning, 104
- SWOT analysis, function of, 116
- Symbolism, corporate, 66, 145
- Synergies, 69, 73, 78, 83
- Syntegration, 122, 134
- System 1, 198, 200, 202, 204, 207
 - boundaries between systems 1, 78
 - customer, focus on, 55–56
 - ecosystem *see* ibid
 - elements, 41
 - environment, primary, 41
 - environment, secondary, 42
 - initiates system 3*, 87
 - interfaces between system 1 operations (“squiggly lines”), 54
 - management *see* ibid
 - operation *see* operation
 - purpose of the organization, creating the, 39–40, 55–56
 - reference point for system 5, 162
 - regulatory Center, 53–54
 - synergies, 77
- System 2, 25, 61–73, 196, 198, 200, 202, 206, 208
 - adaptability, 64
 - double role and dilemma, 68–70
 - elements, 62
 - end in itself, danger of becoming, 62
 - heterogeneity of systems 1 and challenge to promote synergies, 73
 - informal coordination, 67–68
 - institutional spaces, 24, 63, 64
 - manifestations, 65–66
 - reasons for its existence and size, 70
 - regulatory center, 63, 64, 198
 - social spaces, 66
 - support to system 3, 82
 - systemic tasks and purpose, 61–62
 - trust, 66
- System 3, 26, 78–83, 196, 198, 200, 202, 206, 208
 - accountability channel, 78, 79–81
 - channels to systems 1, 25, 78
 - communication style, 88
 - composition, 81–82
 - double role, 92
 - gateway position between operational organization and strategic metasystem, 93
 - legal and corporate requirements, channel, 78, 81
 - power over metasystem, 92, 120
 - power over systems 1, 81

- relevance filter for the strategic metasystem, 93
 - resource bargain channel, 78
 - synergies *see* synergies
 - systemic tasks and purpose, 26, 78–79
 - system 2, interaction with, 81–82
 - system 4, interaction with, 121–123
 - System 3*, 27, 83–89, 197, 200, 203, 207
 - activated by systems 1, 87
 - complementary to system 2, 86
 - different perspective on operational organization, 85
 - double role and the auditor’s dilemma, 88–89
 - information deficit, 86–87
 - not the “spy” of the metasystem, 84
 - opposition to system 2 and 3, 85
 - purpose and objective, 83, 89
 - self-understanding, 89
 - spontaneity, 86
 - system 2, relationship to, 86
 - systems 1, participation of, 87
 - trust, needed to generate, 87
 - System 4, 28, 91–123, 199, 200, 203, 207, 209
 - balance between creativeness and operational organization, 115
 - challenges, 118–121
 - common picture and focus, challenge to create, 114
 - composition, 118–120
 - creativity, 104–105
 - different perspectives, generation of, 101–102, 105–106
 - fragmentation, 118–120
 - identity and self-understanding, impact on, 117
 - inferiority to system 3, 120
 - instruments, 95
 - intangible reality, challenge of, 118
 - New business, structure, 109
 - observing the future, 100–101
 - observing the wider environment, 97
 - simulations and scenarios, 98
 - structure, 107, 108, 119
 - systemic tasks and purpose, 96
 - system 3, interaction with, 121–123
 - unknown future as imperative for the organization’s creativity, 104
 - System 5, 127–162, 197, 200, 201, 203, 207, 209
 - abstract, danger of becoming, 161
 - algedonic channel, 154
 - balancing hierarchy and heterarchy, 136–137
 - balancing operational and metasystemic organization, 157–158
 - balancing system 3 and 4, 150
 - bridge-building, 152
 - closing the organization, 140–142
 - cohesion, 152, 156–157
 - composition and Ashby’s Law, 139, 142–143
 - conscience of the organization, 158–159
 - examples and anecdotes, role of, 144–145
 - experience, legitimacy of system 5, 132
 - higher-order perspective, creating, 130
 - history of organization, custodian of, 137–138
 - listening, 156–157
 - manifestations, 143, 144–145
 - model of the wider system, 160
 - monitoring channel to system 3 and 4 equilibrium, 152
 - objectivity and neutrality, 151
 - power, 127, 151, 153
 - purpose, focusing on and defining, 161
 - quality criteria of its decisions, 132
 - relationship to external environment, 162
 - responsibility, 158–159
 - self-reflection as system’s 5 modus operandi, 130
 - systemic tasks and purpose, 30, 160–162
 - truth, 150
 - values, principles and identities, need to contain requisite variety, 160–162
 - viewing it “all”, 132, 133
 - System functions, 31, 219, 225
 - Systems 3–4 equilibrium, 29
- T**
- Tact, role of, 177
 - Target setting, 53, 80, 170
 - Temporal dimension of organizations, 78, 86, 179–181, 216
 - Translation
 - challenges, 187
 - competency in organizations, 45, 188–190, 218
 - environment and organization, 44
 - information capacity, 191
 - transducers, 187
 - Transparency between organization and environment, lack of, 43
 - Transparency, organizational, 52, 67–68, 170–172
 - Trips, contribution to the generation of different perspectives, 103

Trust, 66, 87

Truth, 133, 136, 150, 200

V

Variety, 7, 73, 219

Variety processing, 5, 45, 46, 73, 215, 219, 222

Viability, organizational

Ashby's Law, 15

aspects, 4, 5

capability to translate, 45

capacity to produce purpose and value, 160

different perspectives, importance to

generate, 85

dynamic stability, 17

flow of information, 192

hierarchy, function of, 60–61

Life, biological characteristics of, 4

self-determination, 4, 216–217

Viable System Model

corporate functions, 34

graphical representation, 31, 54, 79

its logic, 213

logic and architecture, 39–40

numbering logic, 40

system functions, overview, 32

Von Förster, Heinz, 129

W

Walking through the organization, 101, 155

Whistleblower lines, 87