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Project Management at the Edge of Chaos

Social Techniques for Complex Systems

Springer

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Foreword by Heinz Schelle

Some time ago, when Alfred Oswald asked me to write a foreword for this book, I agreed without hesitation. I was very familiar with the book "The Collective Mind Method. Project Success through Soft Skills" (Note: English translation of the German book title), which he had published with Jens Köhler in 2009. I had discussed it at length in the journal "projektMANAGEMENT aktuell" (issue 5-2011) and still consider it one of the most important German project management books of the last few years with its central message being that people should be used in projects according to their strengths. To accomplish this task, a comprehensive set of instruments is offered.

The current aim of the authors, now including Roland Schmitt, is also to provide appropriate social techniques. This time it is the authors' intention, to master the complexity of projects embedded in social interactions. For a long time in our discipline, it was almost exclusively about getting a grip on the complexity of developing technical systems. The most impressive example is probably the contributions that NASA and the United States Department of Defense have provided for project management development. In this context we can consider network planning, and in the context of the planning and development of programs, such as the Apollo program, sophisticated configuration management, which in some cases is even considered an engineering discipline. "New Taylorism" as a term for this import from the United States was by no means entirely unjustified. In any case, man as acting subject in projects, is not present in these concepts.

This very biased, even rightly called, technocratic approach, has long dominated our view of projects, perhaps for too long. Even today, it still dominates in many textbooks. It was relatively late that the perception expanded to projects as social systems. One of the protagonist in German-speaking countries was the Austrian Consulting Group Neuwaldegg. In the meantime, our knowledge of social systems has expanded considerably. Organizational psychology, behavioral economics, Synergetics and neuroscience can be mentioned here, as a scientific disciplines that have greatly contributed to this new perspective.

The undertaking of the three authors – to provide the tools for "optimum tuning of social interactions" and the management of complex systems, based on a viable theory and model with their motto: "nothing is more practical than a good theory", thus has

considerable potential. The authors succeed in making complex material easily under-standable, interspersing with a variety of stories and extensive application examples.

The authors regretfully note that the subjects of complexity and self-organization in social systems are not covered at school or university or during vocational training. And most certainly not in politics. Current discussions on how to deal with the refugee problem clearly demonstrates this. Thinking in simple linear cause-effect relationships predomi-nates. Every day, we can see that measures decided and implemented by governments ad hoc in blind activism, do not even consider even slightly predictable and relatively short-term side effects.

It is therefore imperative that the "method gap in dealing with complexity" is closed. This is the aim of the authors with this work. I congratulate the team and wish the book and the ideas contained within it, a wide distribution.

Univ.-Prof. Dr. Heinz Schelle
Honorary Chairman of GPM German Association for Project Management e.V.

Authors' Preface to the English Edition

This book is a translation of the German edition of our book "Projektmanagement am Rande des Chaos", published by Springer-Vieweg in 2016 and 2017, respectively. Despite the vast array of existing management literature, we nevertheless see a gap in the area of management dealing with theories and models in complex contexts, e.g. as required for complex projects. We have therefore taken a completely new approach and transferred the fundamental principles of the universal phenomenon of self-organization as described in the theory of Synergetics, from the natural sciences to leadership of organizations and projects. We believe that this approach will provide deep, new insights to the reader, with only a few parameters, the so called setting, control and order parameters, very well suited to determine the coarse-grained behavior of social systems such as organizations and projects. This will surely help move the focus away from usual nitty-gritty details, to a few, but important quantities, which will bring the reader directly to a solution for everyday problems at work in industrial and public organizations. Concentrating on micro-tier details and applying straight-forward linear concepts (as with Taylorism) is no longer sufficient to solve complex real world problems. Linearizing methods are simply outdated for the management of complex environments! We are sure that you, the reader, perceive this every day!

Individuals and their interactions are the center of our attention. We make transparent their behavior, motives, needs, temperament and culture, including their mutual dependencies, and we state how an extremely practical framework can be built upon an integral network of theories and models. "Nothing is more practical than a good theory" is what we genuinely believe! We hope that the reader can apply the material we have presented immediately in their field of business. If any reader feels that our management book is more abstract than an English management textbook, we encourage them to say out loud: "Nothing is more practical than a good theory" and then just apply it – to see an immediate benefit.

The book also contains entertaining dialogues and stories to elucidate our message. We have adapted some of the personal names and cultural specifics in the German edition to suit the English-speaking world.

With regard to the cited literature, we have used both English and German sources. We apologize if some of the sources are only available in German.

We truly believe that this book will enrich the English-speaking market of management literature and hope the reader enjoys gaining insight and becoming familiar with the material presented in the book.

Stolberg, Mutterstadt and Weinheim an der Bergstraße   Alfred Oswald
November 2017   Jens Köhler
                                                                      Roland Schmitt

Authors' Preface to the German Edition

Not another book on complexity and this time with a focus on project management! And to top it all, it deals extensively with models and theories! However, it is a book that is necessary and even imperative: In the current and future project world, we are dealing with interconnected, feedback systems, meaning we have arrived directly in the realm of complexity: It creates self-organization and thus completely new structures, intended or unintended, stable or chaotic. Complexity is not a phenomenon of our time, but is part of nature and furthermore, the basis of any form of life.

Unfortunately, the topics of complexity and self-organization in project management are far from having been covered widely, whether at school, vocational training or university. However, practice requires that we deal with complexity now: Think for example, of a composite of interconnected companies or a multi-component, networked IT system: Changes occurring in one place, suddenly result in unexpected changes elsewhere. A linear cause-effect analysis is no longer valid. Now, to a large extent, value creation in industry, occurs in projects. High values can be created, as well as rapidly destroyed. This book will contribute to closing the method gap for dealing with complexity, and further contribute to minimizing the value-destroying component in the everyday life of projects and help to lead the value-creating component to new, outstanding project solutions.

Complexity lies not only in the technologies used, but also in social interactions. Regulating and controlling these interactions by means of appropriate social techniques is the subject of this book and demands an engagement with theories and models. How do we wish to impart this information? One of the key messages of this book is: There is nothing more practical than a good theory.

Let us directly adopt this sentence and use a simple theory, the metaphor of the "iceberg", as an elucidation of the very basis of the book: An 1/8 of an iceberg is visible above the water, but 7/8 is invisible below the water surface. Although this 7/8 is indeed invisible, it is by no means ineffective, with potentially fatal consequences for those at sea. When this metaphor is applied to the social system "project", "traditional" project management methods and processes, which are above the "iceberg", represent smaller, visible events – but the larger and more dominant part remains below the "waterline", and this represents social factors.

The true purpose of this book is to make projects successful by the optimum adjustment of social interactions in a work world, which is increasingly dominated by knowledge work. This can be achieved by a framework of networked theories and models based on the latest scientific findings and adapted for project practice. For this purpose, among others, we use the latest research results in neuroscience and Synergetics, which are both topics of complexity research.

After a general introduction in Chap. 1, in Chap. 2 we address the relationship between social techniques and complexity. Fundamental definitions, such as "What is complexity?", will be given. In Chap. 3, we discuss the foundations for complexity regulation options. With the fundamentals and possibilities of complexity regulation in Chap. 4, options for leadership in complex social systems are outlined, derived from models and based on concrete examples. With the help of the framework developed in the previous chapters, in Chap. 5, we compare known management systems and check their basic assumptions. Finally, Chap. 6 draws a conclusion and an outlook: This may encourage you to use the contents of the book and thereby sharpen your skills in dealing with complexity.

No less important than the main text in Chaps. 1 to 6, are the annexes: To achieve stringency and better follow the guiding thread for understanding necessary descriptions of important models and theories. Depending on personal knowledge background, it may also be useful to turn to look at the annexes first.

Examples in the book should also not be forgotten: For better understanding and to support the transfer of knowledge into practice, the following examples have been included:

In Chaps. 2 and 3, among other examples, you will be accompanied by Tobias Ehrlich and Heiner Priesberg, both employees of the fictional company MedicalFit, who explain certain content in depth, based on partly exaggerated dialogues.

In the key Chap. 4 "Leadership in Complex Social Systems" these dialogues flow into more extensive, accompanying application examples.

In Chap. 5 "Consequences for Management Systems", three detailed, practice-relevant examples of fictitious companies are used for deepening knowledge.

For further illustration purposes, in several passages, various working examples taken from workshops have been incorporated into the text.

For better traceability, the text is structured in such a way that many cross-references and content clues are included. In addition, we have deliberately incorporated redundant information, so that content can be branded in the memory more easily.

Chapters 1 to 4 are preceded by quotations from the works of William Shakespeare and the crime author Fred Vargas. These aim of these quotes is to set the scene for the following text and invite associative play of thoughts.

We hope with the book and the associated different ways of approaching complexity, to provide a tool in your hands, which increases your knowledge and practice, based on your experience so far and helps you brace yourself for future situations in a complex environment.

We hope that this book will also contribute to diffusing complexity and self-organization on a wider scale.

Stolberg, Mutterstadt and Weinheim an der Bergstraße   Alfred Oswald
Jens Köhler
Roland Schmitt

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A book such as this is always preceded by continuous and intensive professional discourse in a stimulating practice environment. Therefore, we would firstly like to thank Prof. Dr. Heinz Schelle, a doyen of project management in the German-speaking community, for his continued interest in our work, and in particular for the foreword to this book. We would like to thank him and the GPM e.V. (German Association for Project Management) for the professional cooperation and enabling our ideas and concepts to be published.

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In addition, we would like to thank Hermann Engesser, Dorothea Glaunsinger and Gabi Fischer, Springer Verlag, Heidelberg, very much, for the many years of professional collaboration.

And last but not least, we would like to thank our families. For several years, they have been the stimulating force and support, to enable us to be able to actively push forward our objective, the development of project management. The insights we have gained are also relevant and interesting for the private, as well as the business environment.

Contents

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earned his doctorate in Theoretical Physics at the RWTH Aachen University. He is
Managing Director of the IFST-Institute for Social Technologies GmbH consulting insti-
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tiveness of organizations through innovative social technologies. He has many years of
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formation of project-oriented organizations into high-performance organizations.

Jens Köhler   BASF SE, Ludwigshafen, Deutschland
received his Diploma in Physics from Bonn University and already began tackling the
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first gained experience in managing business and software development processes after his
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ate management studies at the University of Portsmouth in the UK focused his attention
on the psycho-social aspects of cooperation between people. Since then, his research inter-
est has been the transfer of theoretical findings of self-organization and neuroleadership
into professional management practice.

Introduction and Motivation

<div align="right">1</div>

…Things growing are not ripe until their season:
So I, being young, till now ripe not to reason;…

<div align="right">William Shakespeare, A Midsummer Night's Dream</div>

We cannot close our minds to the professional handling of complexity: Projects are increasingly becoming embedded within an incomprehensible and unpredictable context. Context perceived this way, is usually associated with complexity. With this in mind, the mastery of complexity is a necessary precondition for successful project management in the twenty-first century. Additionally, we can assume that the boundaries between project management and general management are increasingly disappearing and that the tools presented in this book are applicable to all kinds of management.

Admittedly, the title "Project Management at the Edge of Chaos" is supposed to grab attention, but at the same time, it represents the contentual design of this book.

During our search for management tools, our aim was to avoid being misguided by stereotypical assertions like "Complexity is different to complicatedness", "Complexity only exists in nature", "Complexity is bad, simplicity is the way", "Get out of the complexity trap", "Complexity must be reduced" or "Complexity is subjective", to name just a few.

Instead our aim was to apply insights from complexity science, physics, neuroscience, psychology and the social sciences to elaborate the field of management. In doing so, we wanted to simplify these insights, but only as long as the insights were not distorted. Likewise, we endeavored to create an interdisciplinary network of theories and models, rather than keep different disciplines as separate individual theories and models. For instance, it is necessary to interpret the insights from neuroscience and the natural-scientific theory of self-organization in light of practice-oriented cases of management,

and additionally to demonstrate which neuroscientific insights are of importance in the self-organization of social systems, and vice versa.

We emphasize the integral networking of different theories and models, especially because this results in completely new insights and is related to a higher level of quality of management design.

In complex projects, this interdisciplinary network of theories and models generally replaces operations based on Best Practices and standardized methods. However, theories and models are only effective in practice if they are suitable for successfully shaping the world. We will show that the deliberate application of theories and models in project management enables the acquisition of comprehensible experience. Experience acquired this way is the key to developing intuition: The application of theories and models develops intuition in a comprehensible and verifiable way. This is a new approach which reveals intuition to be a professional way of handling complexity. In complex and chaotic systems, such designed and trained intuition is probably the only way to act professionally.

The formation of personal experience based on this integral network of theories and models, has, in combination with professional intuition obtained, the effect of fostering holistic and systemic thinking. It is another crucial precondition in order to be able to take action within complex contexts and systems. To the best of our knowledge, holistic and systemic thinking are present if:

- an intuitive feeling manifests for the networked interaction of system elements and respective emergent system structures,
- a "Big Picture" of the system intuitively appears in one's mind,
- the possibilities and limits of one's own abilities in complex systems are recognized attentively and mindfully.

Therefore, within this book, we address the following key questions:

- What is complexity and what creates complexity? Which systems are able to show complex behavior? How do we recognize complexity?
- When do value-creating and value-destroying complexities occur? How do networked (social) interactions occur?
- Which possibilities exist for regulating and absorbing complexity? Do instruments for regulating and absorbing complexity have to be complex, too?
- Which possibilities and limits exist for the leadership of complex systems? Which role does self-organization have in this context? Which role does intuition have while regulating and absorbing complexity?
- Which theories and models are applied to regulate complex systems? What does the resulting network of theories and models for managing complex projects look like?

Social Techniques and Complexity

<div align="right">

2

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> *It's a pity thoughts don't have names, isn't it? You could call them up, and they'd come and lie down at your feet, crawling on their bellies.*
>
> Fred Vargas, A Climate of Fear, English by Siân Reynolds

In this chapter we forge a bridge between our fundamental assumptions and beliefs, the "Big Picture" which underlies our project management approach, and our understanding of complexity and the related consequences.

We begin with a discussion of the terms "theory and practice" and "social technology and social technique" and outline, from the perspective of project management, the essential questions, which we intend to answer in this book

Within the section, "Attentiveness, Mindfulness and Wisdom", we show that the approach we propose contributes to an integral perspective of the world.

The "Big Picture" describes an operational framework, which enables the repeated synchronization of theory and practice, to be able to find, inside complex projects or environment, the way to the goal.

In the section "En Route to Complexity", we make an important distinction between drivers of complexity and domains of complexity. In addition, we introduce value-creating complexity and value-destroying complexity.

Subsequently, we link complexity to "blind mental spots" like uncertainty, suspense and risk.

The final section "Philosophy of Complexity" summarizes the implications of a "world shaped by complexity" and lays the foundation for all further chapters.

2.1   From Negative Words and Basic Assumptions

That's you, is it, Queen Mathilde, making cruel jokes?
Yes, it's me, Charles. I'm getting my retaliation in first. You know
what they say: 'If you want peace, prepare for war.'

Fred Vargas, The Chalk Circle Man,
English by Siân Reynolds

Even though terms like "complexity" or "chaos" are on everyone's mind, sometimes it's better to avoid the term complexity in conversations. The higher the represented hierarchy, the less welcome this word is. Complexity, not only indicates unpredictability, but also "we do not want this", "complexity is bad"; in a nutshell, complexity is something to avoid: Complexity emerges where bad management exists.

We will demonstrate that complexity is not always "bad", nor is it due to "poor management", but good management distinguishes itself by utilizing the value-creating potentials of complexity for its goals: Since complexity is the foundation of our being and therefore of any evolution.

Coming close second to this aversion, is the word "theory". Phrases like "we do not want to theorize" or "the whole thing should be practical" are bandied about. If the worst comes to the worst, "best practices" are recalled and people want to rely on them.

There is Nothing more Practical than a Good Theory

Priesberg encounters his colleague Ehrlich in the hallway after a fruitless team meeting. Priesberg seems tired and approaches him: "The whole day long, I have tried to convince my project leader of the fact that his best practices should be supported by theory, especially because they have been transferred from another project and in my view are not useable in the current project. He increasingly treats me like a theorist in an ivory tower– both myself and my effectiveness are undermined, despite the fact that I am one of the backbones of the team."…"and there is nothing more practical than a good theory," Ehrlich cups his hands around his mouth to magnify his voice, and shouts after the project leader as he rushes past them without a word of greeting.

We claim that both theories and individual models require practical value. They need to be useful in practice and they need to be testable in practice. We are guided here by the basic assumption that "There is nothing more practical than a good theory". Theories are nothing more or less than deliberately structured thoughts. And thoughts contain images, therefore models, of the perceived practice. Consciously perceived models are the basis for profound thoughts and subsequently profound theories. Although we value a constructivist approach [1] to the wide range of individual perspectives on the world, it does not lead us to assume that all thoughts are equally appropriate for representing reality. Therefore, we do not believe that all theories and models are equally "good". Different theories and models of the same practice usually differ significantly in terms of their practical relevance. Theories and models are only of practical relevance if they are adapted to shape the world successfully.

We do not want to understand theory only as form of discourse. Nevertheless, we regard it of importance that theories and models are selected via discourse and the best possible theory, in respect of a practical issue, is further developed. It should be possible to derive guidelines for future activities from a good theory and models.

**Use Theories and Do Not Ignore them!**

Ehrlich approaches his colleague Priesberg: "Nowadays, anyone who fails to come to grips with the value of models and theories, is squandering their future. A few years ago, when project environments were static and the few theories that there were, had been developed as best practices, like the preparation of a network plan; deeper reflections were not necessary. Nowadays, this is not possible, because project environments change abruptly, meaning that best practices often lose their validity when introduced into new contexts. In order to sufficiently understand and govern the environment, tools are required. With the help of these tools, your project leader is able to recognize how his uncooperative behavior is potentially damaging to cooperation within the team and promotes value-destroying complexity: If your role is undermined, professional expertise will not be fully embraced and crucial aspects of the solution to the problem will go unheard. Now, the whole, is less than the sum of its parts."

That does not mean that we have an unconditional belief in the benefits of evidence-based management. We believe that both qualitative and quantitative methods are valid for verifying a theory or a model. We also believe that quantitative methods (e.g. statistics) are no guarantee for meaningfulness, but we are led by the basic assumption that evidence, solely based on statistical methods, is not of value without a practical theory.

Furthermore, we believe that the separation of social and natural sciences may have many practical implications, but should not lead to behavior where common characteristics are not actively searched for. For this reason, the content of this book is grounded on the following fundamental axiom: "Complexity is a universal phenomenon, the basic principles of which, can be applied to all objects or forms of existence". Out of this, our working principle emerges, applying natural scientific principles of complexity to the social discipline of project management.

The sub-title of this book is "Social techniques for complex systems". Here we draw on Beinhocker's understanding of the term, which he outlined in his excellent book "The origin of wealth" [2]:

"Social Technologies (STs) are methods and designs for organizing people in pursuit of a goal or goals." Social technologies are understood as an addition to physical technologies. Physical technologies denote the classical field of technologies in the natural and engineering sciences. Figure 2.1 elucidates this perspective with the help of the "iceberg" model: 7/8 of the factors determining our lives can be found beneath the water surface and only 1/8 of these factors lie above the water surface. Social technologies deal with the explanation of "social factors" and their interplay with "physical factors". By social techniques, we mean concrete forms of social technologies. Hence, we understand project management as a social technology comprised of several social techniques, thus models and methods for leading, planning, team-building etc.
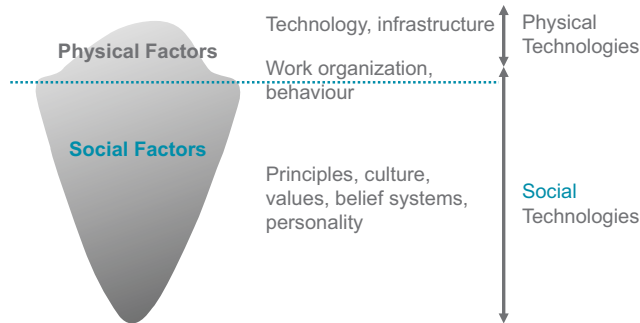
Fig. 2.1 Social Technologies in the iceberg model

The term social technique was recently revisited by the organizational psychologist Lutz von Rosenstiel in the "Mit Sozialtechniken 'Prozessverlusten' entgegenwirken" interview [1] [3] and also used in the book by Lars Vollmer [4], which is well worth reading. This is all the more surprising since the terms "social" and "technique" are perceived as contradictory by some. The sociologist Habermas once downgraded the work of his colleague Luhman by announcing that Luhmann was pursuing social techniques for his system theory, by adopting natural scientific ideas. The term "social engineering" previously created by the philosopher Popper, suffered a similar fate and unfortunately is nowadays often used in the context of manipulative activities.

We want to understand these concepts in their original intention: Social techniques serve to master complex systems, or as we will discuss later on, serve to regulate them. We will examine our understanding of the terms complexity and complex in more detail in the next section. By using a system, we will come to understand an aggregate of elements which relate to and interact with each other in such a way that they are perceived as a unity and, in this respect, delimit themselves against the surrounding environment, their context. Examples of systems are: social systems like teams, organizations and societies, natural systems like humans, animals, plants or biotopes; or technical systems like laptops or smartphones.

Complexity in a Nutshell

"Maybe I acted too inept when I suggested the theoretical background to my project leader," Priesberg ponders out loud: "What exactly are the essential elements, which a theory for project environments should contain?" Ehrlich replies spontaneously: "I would say 'system', and 'interconnectedness', as well as 'interaction' and ' complexity'. In the future, you will quickly become accustomed to these terms. Actually, it is really easy: First, systems consist of many individual elements, for example the brain contains countless neurons, which are constructed relatively simply, are interconnected to each other and interact via electrical impulses. Therefore, the brain is a system. On top of that: The 'interaction', brings some excitement, since only through

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[1] Translated by the authors: "Resist 'process losses' with social techniques".

the interaction of a system's elements does complexity arise: A neuron fires an electrical impulse to other neurons and an emerging pattern of signals has a reciprocal action on the original neuron. By doing this, the neurons influence each other and this can, depending on the kind of interaction, either lead to stable or unstable excited states within the brain, which in turn are responsible for very different behaviors. Thus, the brain can be called a complex system. You can give this example to your project leader. However, I do not believe that he will necessarily be responsive – as he seems trapped by the neuronal patterns which were formed in his own head a long time ago."

As part of the sociological system theory [5], interpersonal communication is also understood as a system. Communication and its related system is considered to be a social "field", with which we, people, interact. With respect to usefulness, the system of communication is only considered to be a sub-system of a social system, which consists of a communication system and its corresponding agents, namely people.

What comprises a system, can be illustrated using a simple example: There are a number of people in a room. At first, there is no (recognizable) interaction between them. Then, an external moderator assigns an interaction activity to the participants: Everyone selects two other people, estimates the distance between themselves and these other two, and then maintains that distance during subsequent changes in position. External intervention by the moderator, who leads one of the participants by the hand to another position within the room, is subsequently followed by a change in position by everyone else. The intervention may result in the system ending up in a stable state after a short period of time or, after a longer period of time, still shows variations, sometimes even with apparently characteristic patterns of movement. If the external intervention is ignored, there will be no cause and effect pattern, but the system as a whole appears to satisfy the rule of interaction. Interactions are obviously characterized by the following fact: Linear cause and effect mechanisms lose their validity, and instead "complex" and reciprocal relatedness of all elements in the system takes their place. What is typical, is that the reaction of the system is independent from the properties of the system's elements. Of course, this is not always true, because if this small experiment is carried out in distinct groups, "deviations" will indeed be observed: Either because someone has asked "why" or because the person affected by the intervention, insists that: "This position is already the one which satisfies the rule of interaction".

A similar example for illustrating the characteristics of a system is introduced using a simple game and its rules by Simon [6]: Every person in a group chooses a three-digit number, the number serves as an address. While throwing a ball to each another, the address needs to be correctly named … To follow the rules, very simple number sequences are used, e.g. 333, 118, 110, 545…after a period of self-organization, certain patterns, which characterize the system as a whole, can be observed. The manifestations of the patterns depend on which numbers are the easiest and quicker to remember and also, which ones are preferred by the group.

As will be explained in detail in the next chapter, the interaction of a system's elements creates a reciprocal "concatenation" of the elements: On the system level, complex overall-behavior is established, which emerges from the interaction on the system's element level. The different overall-behaviors on the system level are connoted as emergent phenomena, which have systemic properties. Systemic properties are properties which cannot be assigned to a single element of the system, but only to the system as a whole.

Projects are, as temporary organizations, social systems with systemic properties which interact with their environment. On closer examination, this environment can again be described as several systems (e.g. the departments of an organization).

In order to answer the central questions raised in the previous chapter "Introduction and Motivation", at first it is necessary to answer the following theoretical questions, so that subsequently, practice relevant questions can be answered. The questions relevant for practice, are marked in italics:

Which interactions occur among the system's elements? How can these be described? *What does that mean for a project team's or organization's action options? Which actions are target-aimed, which ones, by contrast, are pointless and lead nowhere?*

What impact does the system's elements have on the system? What impact does the system have on its elements? *How is the solution to a task influenced by the traits of the project team members? And the other way around: How does the solution influence particular team members?*

Which properties belong to the elements and which ones are systemic properties? *In practice, how can one distinguish the causes from the emerging symptoms?*

How can the interaction of the system and its environment be described? *Which influencing variables can be identified while looking at the cooperation of a project with various other organizations? Which action options arise from this?*

Which overall-behaviors are established by the social system? Is there a pattern and typical parameters which describe systems by their behavior? Which parameters describe the system as a whole? Are there different kinds of parameters and what are they? *What is the essential information required to describe, analyze and understand a project? Which measures lead to success within the social system "project"?*

Which kinds of intervention are possible? Do they differ with respect to impact on the system as a whole or on particular elements? *How can the project team manage to guide itself towards a successful solution?*

Answering these questions takes place in the light of the following basic assumptions:

Standardized methods and best practices are heavily dependent on context and support neither systemic nor holistic perspectives of a complex system. Theories and models depict complex systems and their environments significantly better.

A systemic and integral (holistic) perspective of complex systems will replace organization and leadership, which only focuses on local circumstances ("micromanagement").

People and their needs move into the focus of leadership. Neuroleadership is considered to be the means for bridging human needs and leadership.

Explorative and experimental learning complement learning through the intake of knowledge. Intuition and rationality are equally applied in order to master complexity.

The recognition of (social) interrelations depends substantially on one's ability to view the context and the behavior occurring within the context in an abstract way. For this purpose, meta-competency is required.

2.2   Attentiveness, Mindfulness and Wisdom

Polonius: My lord, I will use them according to their desert.
Hamlet: God's bodkin, man, much better. Use every man after his
desert, and who shall scape whipping? Use them after your own
honour and dignity: the less they deserve, the more merit in your
bounty. …

William Shakespeare, Hamlet

Theories and models have a threefold relevance for our lives: They are mental images of perceived actuality. They also serve as a basis for the transformation of individual insights into comprehensible and accessible knowledge for everybody. And the third relevant factor is mostly ignored; without a specific "pre-image", we are not capable of perceiving actuality in a conscious manner. The recognition of context and the development of an adequate reaction to a given situation are dependent to a great extent, on our "pre-images". In other words, attentiveness and mindfulness are greatly determined by our ability to make use of mental theories and models for imaging our complex actuality. (For further discussion on our understanding of "theory", we refer to the appendix "Fundamentals Theory and Practice".)

By attentiveness, we do not only mean the level of focus with respect to a particular topic, object or person, but also the ability to recognize the patterns embodied in our environment. Examples of patterns in our communication are e.g. the diverse behaviors of individuals and their relationship with particular motives, values or basic assumptions. Only if this ability of relating things is present, can order be observed in diverse behaviors and the prerequisite for showing mindfulness is be established. Mindfulness means to respect the motives, values and basic assumption of others and to recognize how these motives, values and basic assumptions, together with one's own motives, values and basic assumptions, form a social system of communication on the level of behavior. This is the basis for actively avoiding potential mental blocks and for establishing resonant communication.

With the help of theories and models of personality traits and social interactions, and the willingness and ability to recognize and understand the thoughts, emotions, motives and personality traits of others, our empathy is therefore fostered and in some cases actually made possible. Because, if the behavior of another person is very different from our own, the potential for recognizing and understanding, is for most of us, very slight. In these cases, unjust and negative intentions are easily presumed, which can, on closer consideration, turn out to be positive, yet are tied to inappropriate behavior.

New Methods Require Mental Openness and Systematics

In a quest to conveying theories more easily, on the way to the canteen, Priesberg tells his sparring partner Ehrlich about a colleague, who often drifts off while looking for a solution: "I find this annoying and it's difficult to bring him back to focus." Ehrlich ponders a little, then asks: "When he goes off track, does he subsequently contribute aspects to the solution, which would otherwise have gone unrecognized?" "Yes, this is indeed the case," Priesberg replies. "Then use this property and don't get upset about it," Ehrlich urges and continues: "You will see how theories balance your emotional energy: As soon as you have understood why your colleague acts like he does, you no longer need to be worried anymore and thus have unused energy which you can apply elsewhere in the project."

Priesberg pauses and then carries on somewhat helplessly: "Don't we have to apply and review theories systematically then?" "Smart question," Ehrlich replies. He grins at his colleague and continues: "In order to apply our theories, we need a simple and systematic approach, a framework. I will explain that to you next."

Attentiveness and mindfulness are the core abilities of an empathetic and thus effective executive, and subsequently of an empathetic and effective project manager. One of the aims of this book is to present models and theories of personality traits and social interactions, as tools for cultivating and refining these abilities.

However, these abilities will only develop, if the initial struggle in using the tools is accepted. As soon as sufficient practical experience had been acquired, we were able to observe a substantial impact in the case of project managers:

- (Trained) intuition grows: Complex situations are recognized a lot faster and measures are implemented which lead to success.
- Serenity increases: Perceived self-determination is greater and motives, values and basic assumptions of active individuals are perceived within a particular context. Negative stress only occurs the first time at a much higher stress level.
- Thinking and acting in interrelationships increases: It becomes easier to take a systemic perspective and to identify interactions, instead of linear cause-effect relationships. This is an essential prerequisite to be able to undertake systemic interventions.

These three dimensions: intuition, serenity and the awareness for interrelationships, are the basis for integral comprehension of wisdom [7, 8]. Therefore, one of our aims is to offer tools to interested readers to support them in actively shaping their own personal development.

2.3   The Big Picture

> …*She takes seriously the butterfly wing that moves in New York and causes an explosion in Bangkok. …*
> …*It's in Brazil that the butterfly moves its wing, and it causes a hurricane in Texas.'*
> *Does that make any difference, Danglard?*

Yes. Because once you get away from the original words, the purest of theories just become rumours. Then we don't know anything. From one approximation to another inaccuracy, the truth unravels and obscurantism takes over.

Fred Vargas, The Ghost Riders of Ordebec,
English by Siân Reynolds

We understand project management as social technology which uses theories, models and methods for shaping and leading temporary organizations.

We assume that within a complex project, which we will further elaborate later on, incomprehensibility and unpredictability will dominate. Therefore, a long-term planning horizon is not adequate for governing actions. Instead, it is necessary to construe the periods of reviewing and adjusting governance as short- and mid-term periods. That is why, we combine the fundamental idea of the PDCA-cycle [9], the success factor-success criterion-model [10] and social techniques corresponding to one specific success factor, to form one operational framework for complex social systems. Figure 2.2 demonstrates this operational framework.

The PDCA-cycle (Plan-Do-Check-Act- cycle), also known as the Deming circle [9] from quality management, was formerly deployed as a model of "continuous improvement" and here is deployed as a core model of "continuous adaptation". Figure 2.3 clarifies the ongoing adjustment of the PDCA-cycle adapted to the respective situation:

For the first step of the "Plan", a project is reviewed at the beginning, or as required according to situation, with respect to success criteria (these are the criteria according to which a project is considered to be successful) and operating success factors (these are the
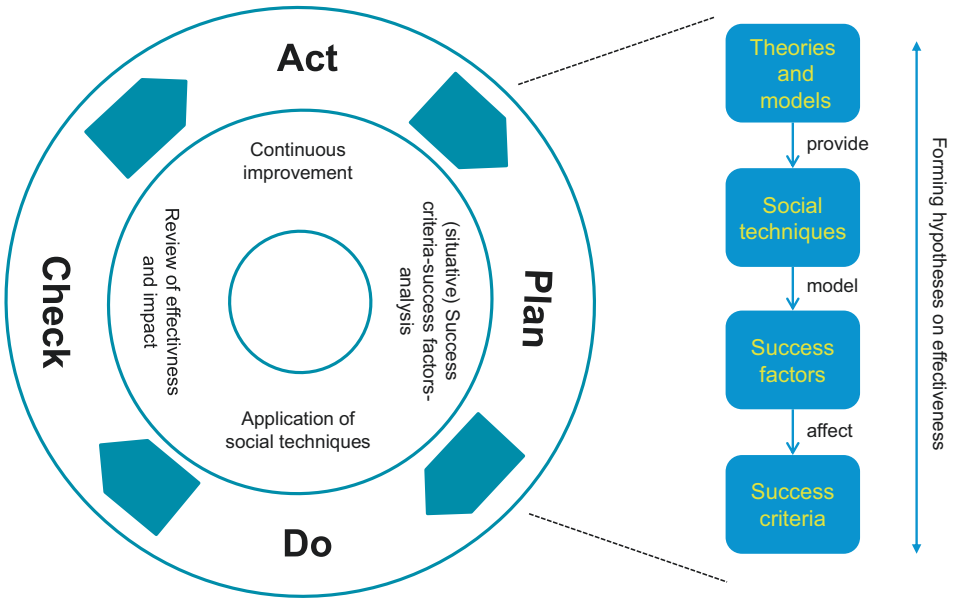
Fig. 2.2 PDCA-cycle, success factors – success criteria, social techniques