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An Emerging Paradigm of Organization Change

THIS CHAPTER CONTRASTS the fundamental assumptions of the traditional paradigm of organization change with the paradigm that is emerging from the science of complex adaptive systems (CAS) (see Table 1.1). Problems with the old approaches are described in both theory and practice. A new complex model of self-organization is described and applied to organization change efforts.

Table 1.1. Traditional and CAS Models of Organization Change

Traditional Model of Organization Change	Complex Adaptive Model of Organization Change
Few variables determine outcomes.	Innumerable variables determine outcomes.
The whole is equal to sum of the parts (reductionist).	The whole is different from the sum of the parts (holistic).
Direction is determined by design and the power of a few leaders.	Direction is determined by emergence and the participation of many people.

Table 1.1. Traditional and CAS Models of Organization Change, Cont'd

Traditional Model of Organization Change	Complex Adaptive Model of Organization Change
Individual or system behavior is knowable, predictable, and controllable.	Individual or system behavior is unknowable, unpredictable, and uncontrollable.
Causality is linear: Every effect can be traced to a specific cause.	Causality is mutual: Every cause is also an effect, and every effect is also a cause.
Relationships are directive.	Relationships are empowering.
All systems are essentially the same.	Each system is unique.
Efficiency and reliability are measures of value.	Responsiveness to the environment is the measure of value.
Decisions are based on facts and data.	Decisions are based on tensions and patterns.
Leaders are experts and authorities.	Leaders are facilitators and supporters.

Organization As Machine

Our traditional world view about organizations is derived from Newtonian physics. This view presents the world as stable, predictable, unaffected by observation, and having clearly discernible causes and effects. From this perspective the organization is like a machine: Its parts determine the whole, and the whole is best understood by analyzing its components. The machine model is evident in current organizations. It can be seen in mechanistic thinking, focus on organization structure, rigorous analysis and measurement, search for root causes, decreasing variation, statistical quality control, extensive instructions for workers, increased specialization, drive for efficiency, and centralized command and control. Sometimes these approaches work, and sometimes they do not. Petzinger (1999) notes that “even as it was toppled from unassailability in science, Newtonian mechanics remained firmly lodged as the mental model of management, from the first stirrings of the industrial revolution right through the advent of modern-day MBA studies” (p.19).

When we are operating in the machine paradigm, overspecification of designs or plans seems natural. We need to think of everything and work things out to the finest detail because the machine cannot think for itself. When we design physical

equipment or other mechanistic aspects of the organization, the Newtonian concepts are appropriate.

Newtonian management methods work when:

- Systems are closed;
 - Change is slow;
 - Interdependencies are low;
 - Certainty is high; and
 - Variability is low.
-

In fact, even artificial intelligence machines need very detailed and specific instructions to deal with all likely contingencies. Think of the amount of programming required for the chess machine that can beat chess masters. There are many day-to-day organizational procedures that must be executed in a precise fashion, with little room for creativity. Routine generation of paychecks is such a procedure, but even the pay system needs periodic rethinking.

Bureaucracies, like machines, work well when conditions remain internally and externally stable. But is this ever truly the situation? If so, how long has it been since organizations functioned in a stable environment?

Changing the Machine

The change methodologies developed in this traditional environment have been *rational, top-down, expert-driven, and planned* change processes. Sound a little mechanical? Some authors have challenged this rational and mechanistic view (Morgan, 1997; Quinn & Cameron, 1988; Weick, 1977) and identified the political, intuitive, random, and irrational variables that have an impact on organizations. Organization change programs, however, continue to operate with rational Newtonian engineering assumptions. The assumption is that senior managers with wisdom will provide the vision for programs that yield significant short-term performance. For example, Ghoshal and Bartlett (1995) praise architects and leaders of organization turnarounds. Hagel (1994) recommends a top-down organization design process.

Evidence that top management has the power to drive change efforts is thin, at best. Take one example: As many as three-fourths of change initiatives such as TQM or re-engineering fail (Cameron, 1997; Senge, Kleiner, Roberts, Ross, Roth, & Smith,

1999). Zohar (1997) claims that most change agents and consultants introduce a change vocabulary with words like restructuring, vision, leadership, and creativity, but that they work within the existing machine-like structures that have no capacity for fundamental transformation. The problem is in trying to change hierarchical, authoritarian organizations (machine model) by recourse to hierarchical authority.

Problem with Traditional Approaches

Traditional approaches to organization change work sometimes. Too frequently, however, they fall short. Table 1.1 lists many differences between complexity science and traditional assumptions. Three of the basic truisms in traditional theory are false in fast-changing systems of today and tomorrow.

Truism 1: Change Starts at the Top

Many organization change initiatives start at the top and deal strongly with any resistance from system agents that blocks progress. Common ways of responding to resistance include downsizing, restructuring, and re-engineering.

System Agents

System agents are the participants in the self-organizing process. They may be individuals, teams, factions, or formal organizational entities. The difference among them and the interactions between them determine the patterns that emerge from the self-organizing process.

Even when change agents tap into the best thinking and energy of the people in the system—from the CEO to the workers on the front lines—assessment of the problem and intervention reflect the same paradigm that generated the problems in the first place.

Change Agents

Change agents are system agents who consciously influence the self-organizing process toward new and more adaptable patterns of relationship and behavior. They may be external or internal consultants, formal or informal leaders, or individual contributors to the work of the system.

Traditional notions of change management are clearly leader-driven. They are based on the principle of continuous measurement and controlling feedback on the

people, processes, and systems within the organization. Change management approaches exercise strong control from the top by constructing processes for achieving strategic objectives.

Change agents are currently expected to calm turbulence during the change effort, to clarify the direction the organization wants or needs to go, and (sometimes) to be the leader of a total system change. What is wrong with this picture? Nothing—if the organization is a machine that needs kicking, oiling, or replacing parts, including its equivalent of a heart. In a self-organizing system, the leader has an important role to play, but creative and long-lasting change depends on the work of many individuals at many different levels and places in the organization.

Truism 2: Efficiency Comes from Control

The traditional paradigm of organization change holds deep, largely unconscious assumptions and values about efficiency and control. These prejudices undermine organizational adaptability. For example, when individuals are divided into small departments, information from the market environment is so diffused that no one in the organization understands what the market is saying about the organization as a whole. If tasks are standardized into “best practices,” routines develop that are grooved and inflexible (Anderson, 1999).

To deal with this lack of continuous adaptation, organizations engage in continuous change efforts. Attempts to spot and fix defects create new, unanticipated problems. Anderson says, “Change initiatives follow change initiatives, eventually leading to cynicism about change management in general. Reorganizations eliminate one set of issues only for another to occur” (1999, p. 114).

In operational areas there is pressure to enhance performance. Subsystems are added to go beyond current limits, to handle the new exceptions, to provide better service, or to otherwise maintain or enhance system reliability. The problem is that each new operating subsystem has its own policies and procedures, and the whole system rapidly becomes overloaded with layers of subsystems. Whatever creativity and energy existed in the original system (for example, Apple in the early garage days) are locked in by the structures that have been laid on top of them. Typically, the organization tries to stretch and change by massaging old models to fit the new situation, such as by repackaging an old product or old plans to fit changed markets or by applying strategies to large organizations that work in small organizations.

Sometimes approaches based on existing assumptions and systems are appropriate, and sometimes they are not. The complex adaptive systems perspective provides

an alternative that allows the change agent and others in the system to examine long-held assumptions and to generate new and creative solutions.

Truism 3: Prediction Is Possible

Managers act as if an interaction in one place will have a predictable or replicable result in another. Rarely does reality match this expectation, but managers continue to act as if it does. They develop detailed strategic plans and linear models of improvement, take actions, and then study why results do not match expectations.

The wisdom of complexity recognizes that all the individuals and subsystems in an organization are linked into complicated dances of change. A small change in one part of the system ripples through the organization and can have tremendous unintended consequences far from the site of the intervention.

These truisms represent basic assumptions about organizations and the processes that encourage change. The complex, open systems of today's organizational environments frequently make these assumptions invalid. Change agents today need viable alternatives.

Alternatives to the Machine Model

Many alternative change methods are available for a change agent. Holman and Devane (1999) identify over fifteen group methods that can guide change in large and small organizations, both for profit and nonprofit. Some innovative organization change strategies focus on motivation (relationships and quality of work life) as a means to change. Others turn their attention to resources (such as data, people as assets, knowledge, and power) to implement change. For still others, structures (teams and minimal hierarchy) or ultimate goals (objectives, values, visions) move the organization toward greater adaptability.

This variety produces a kind of cacophony that defies integration and does not allow any one voice to stand out as a logical alternative to the traditional explanations.

Given the ambiguity and lack of coherent theory, it is no wonder that we revert easily to the machine model. At least the machine model provides an intelligible view of the world and sets solid ground for decision and action. Until we have an equally powerful underlying model for the new world view, we will continue to revert to machine-based explanations and actions. We need a simple, coherent alternative to the old machine model before we can work responsibly in the complex environments of today and tomorrow.

Toward an Integrated Framework

Without an integrating theoretical frame, it is virtually impossible for the practitioner, to say nothing of clients, to comprehend the depth and breadth of the shift from machine to complex adaptive systems (CAS) views.

The way change facilitators think about causes of change determines how they contract, assess, intervene, and evaluate during their interactions with client organizations. If they see causality in terms of traditional systems theory, then they look for systems archetypes (Senge, 1990). If they see causality as an equilibrium-seeking resolution of tension, they look for ways to unfreeze and refreeze (Lewin, 1951). If they see an organization as a machine, they re-engineer its functions or replace dysfunctional parts (Hammer & Champy, 1994). How does one conceptualize change in a complex adaptive system? What foundation does a new integrated framework provide for assessment, intervention, and evaluation of organization change efforts?

Complex Adaptive Systems

A complex adaptive system (CAS) behaves/evolves according to three key principles: (1) order is emergent as opposed to hierarchical, (2) the system's history is irreversible, and (3) the system's future is often unpredictable. The basic building blocks of the CAS are agents. Agents are semi-autonomous units that seek to maximize some measure of goodness or fitness by evolving over time (Dooley, 1996).

Recent discoveries in the physical sciences provide a rich source for innovative models for change in organizations. The "new sciences" of chaos, complex adaptive systems, nonlinear dynamics, and quantum theory all provide revolutionary ways of thinking about causality in natural systems. Various writers have taken these ideas and applied them to organization behavior and management approaches (Dooley, 1997; Eoyang, 1997; Goldstein, 1994; Guastello, 1995; Hurst, 1995; Kauffman, 1995; Kiel, 1994; Kelly, 1994; Kelly & Allison, 1998; Kelso, 1995; Stacey, 1992; Van de Ven & Garud, 1994; Waldrop, 1992; Wheatley, 1992; Youngblood, 1997; Zimmerman, Lindberg, & Plsek, 1998). The purpose of this book is to provide an integrated framework, examples, and tools to help change agents apply these concepts to their own organizational challenges.

By Any Other Name

The study of complexity draws from many different disciplines, each with its own language and special applications.

- Autopoiesis—biology;
 - Complex adaptive systems—computer simulation modeling;
 - Deterministic chaos—mathematics;
 - Dissipative structures—thermodynamics;
 - Emergence—biology and social sciences;
 - Fractal geometry—mathematics;
 - Nonlinear dynamics—engineering;
 - Nonlinear time series analysis—engineering;
 - Self-organized criticality—engineering and computer simulation models; and
 - Self-organizing systems—biology and computer simulation modeling.
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One underlying question shapes the application of complexity theory to organization development: Is a functioning organization really a complex adaptive system? Or does complex adaptive system theory simply provide a new way to think and talk about patterns of organization behavior? This subtle distinction may not matter to a pragmatic practitioner, who focuses on understanding for action. A change agent in the field can design interventions “as if” the system were complex adaptive and move toward productive outcomes. Most readers of this book are probably practitioners who work comfortably in the “as if” mode. For ease of description, this text presents complex adaptive systems as if they were real and distinct from noncomplex adaptive systems.

Pattern, in this context, refers to any coherent structure that emerges from a self-organizing process. Patterns are discernible when similarities and differences are repeated in identifiable sequences and relationships across a system. Examples include corporate culture, behavioral norms, use of jargon, modes of dress, habits of interaction, and so on.

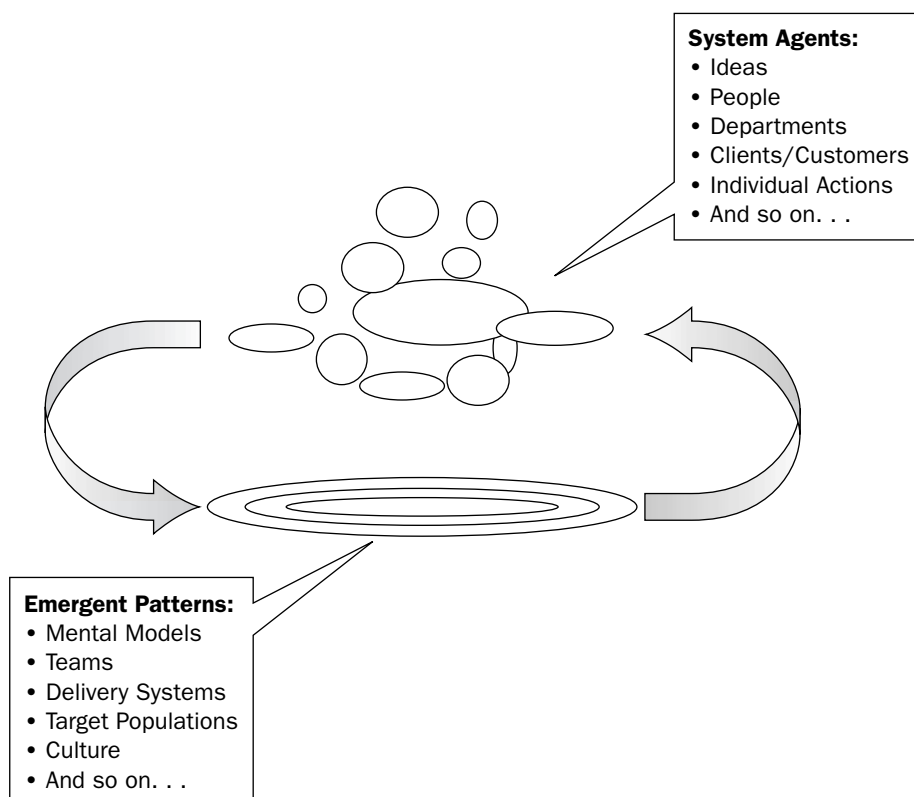
For the theoretical and philosophically inclined, however, the question of reality or perception is an important one. Unfortunately, its resolution is beyond the scope of

this book. Researchers in various fields are designing experiments to test the scientific reality of the theory. Philosophers are building arguments for and against the ontological reality of the theory of complex systems. Change agents can use those discoveries. The lessons from complexity can lead to understanding and informed action by change agents as they engage the real-world problems of their real-world clients.

Change in a Complex Adaptive System

We believe that change comes about in a cyclical fashion in a complex adaptive system. The dimensions of change in a CAS are illustrated in Figure 1.1, Self-Organizing Dynamics. This illustration presents an iterative process in two phases. The phases happen on many dimensions and at many different parts of the organization at the same time.

Figure 1.1. Self-Organizing Dynamics



Self-organization is the tendency of an open system to generate new structures and patterns based on its own internal dynamics. Organization design is not imposed from above or outside; it emerges from the interactions of the agents in the system.

One phase starts with the parts of the system (system agents) and generates a whole, system-wide pattern. The other phase begins with the system-wide pattern (emergent patterns) and affects the interactions of the parts. Each phase is described in more detail below.

From the Part to the Whole

In this theory of change, parts of the system (agents of any size or structure) interact in real time. As they interact, patterns emerge from the system as a whole. The downward arrow on the left side of Figure 1.1 illustrates this phase. For example, a company's marketing and sales force over time develops a pattern for generating leads, strategies for contacting customers, and ways of relating with the production and accounting departments. These patterns are the result of many cycles of interaction. New salespeople are expected to learn the ropes. With the introduction of new technology such as a cell phone or new concepts like just-in-time manufacturing, the old patterns give way to new. The organization reinvents itself every day by making small adjustments in its patterns.

This phase is only part of the whole process, however. The whole also affects the parts.

From the Whole to the Part

At the same time that new patterns are emerging, the old patterns are influencing the behavior of the agents.

Corporate culture, group norms, and documented procedures are examples of ways in which previously emerged patterns become entrenched and affect available options for agents' later actions. Patterns of organizational interaction establish traditions and habits of organization life that tend to bring order.

On the one hand, this constraint is beneficial because it makes some actions and decisions automatic, releasing energy for more creative and challenging tasks. On the other hand, too much dependence on old patterns of behavior locks individuals and groups into habits that may not be adaptive in new circumstances. The upward arrow on the right side of Figure 1.1 denotes this phase of the process.

The system-wide patterns can be considered both effects (of previous agent interaction) and causes (of future agent behavior). As the patterns emerge, they constrain the behaviors of the parts in their future interactions. In this messy and iterative manner, the system lurches and searches its way to new organizational relationships and structures that integrate internal and external forces.

Emergent Patterns Through Self-Organization

The agents of a complex adaptive system interact, and patterns form over time. The patterns then affect how the parts interact to form future patterns. Change agents are well-aware of this cyclical process of interaction and group formation. Knowing that this evolutionary process takes place, however, does not necessarily provide the change agent with effective options for action.

Complex adaptive systems studies in both social and physical sciences, however, provide insight into the ways that the patterns emerge and provide guidance for the change agent who wishes to influence the evolution of new and innovative patterns. Complex adaptive systems investigations have revealed that three factors shape self-organizing patterns: container, significant difference, and transforming exchanges.¹

By understanding and manipulating these three conditions, the change agent can support effective self-organization.

Conditions for Self-Organization

Three factors influence the placement, shape, and power of the patterns that emerge in complex adaptive systems: (1) container, (2) significant differences, and (3) transforming exchanges. These three conditions for self-organization are described in detail below.

Container

Container sets the bounds for the self-organizing system. It defines the “self” that organizes. The container may be physical (for example, geographic location), organizational (for example, department), or conceptual (for example, identity, purpose, or procedures).

¹For a complete explanation of the sources, derivation, and testing of this approach to self-organizing human systems, refer to G.H. Eoyang, *Conditions for Self-Organization in Human Systems*. Unpublished doctoral dissertation, Union Institute, Cincinnati, OH, 2001.

A *container* establishes the semi-permeable boundary within which the change occurs. Within this container, new relationships and structures form over time. Many different aspects of a system can serve as a container. A physical container exists when the persons who work in the same building develop relationships that are different from those they have with persons who work in remote locations. An organization container exists when members of one department interact among themselves differently than they interact with others. Professional, personal, psychological, social, and cultural containers shape the behavior of people in every environment.

Examples of Containers

- *Physical* (building, campus);
 - *Organization* (department, function);
 - *Behavioral* (professional identification, culture); and
 - *Conceptual* (purpose, procedures, rules, budgets).
-

Containers hold the parts of the system together so that the self-organizing process can move forward. This cohesive force can take a variety of forms. Sometimes the container is a central purpose or charismatic leader that pulls the parts of the system together. This type of container works like a *magnet* to draw agents into the system. In other situations, the container can function like a *fence*, defining the outside limit of the system. Physical boundaries or group membership criteria provide such fence-like containers for a system. A third type of container depends on the one-to-one connections among agents. Natural *affinities*, such as culture, gender, or personal history, bind the agents in a system together. The type of container (magnet, fence, or affinity) determines the shape and speed of the emerging patterns.

JUST AS A PERSON NEEDS time and space to incubate thoughts before a new idea can emerge, a system needs a bounded space for the emergence of new patterns.

Any one, or all, of these structures can provide the history, beliefs, values, or norms that constrain and contain the emerging patterns in the system. Thus contained, the interactions of the agents can have sufficient time and opportunity to make contact and allow the self-organizing changes to occur. Just as a person needs time and space to incubate thoughts before a new idea can emerge, a system needs a bounded space for the emergence of new patterns.

In a CAS, containers are not mutually exclusive. One individual can be “within” multiple containers at the same time, such as two sets of role expectations from two

different bosses in a matrixed organization. He or she may experience dissonance, frustration, and confusion when trying to participate in two containers simultaneously, especially when the two are evolving toward quite different patterns of behavior.

A human system that is without a clear container risks dissolution. If a new Internet start-up company does not successfully develop a corporate identity to differentiate itself clearly from its competition, there will not be sufficient ground for self-organization.

Significant Differences

Significant differences determine the primary patterns that emerge during self-organizing processes. A difference between two agents may be reflected and reinforced by other agents in the system, which then establishes a system-wide pattern.

Any difference that exists in the system can serve as the difference that will shape the emergent patterns. The possibilities are endless because a CAS can have an unlimited number of differences.

Examples of Significant Differences

- Power;
 - Levels of expertise;
 - Quality;
 - Cost;
 - Gender;
 - Race; and
 - Educational background.
-

If, for example, level of expertise is a significant difference, the patterns that emerge will embody the various areas of knowledge and experience inherent among the agents. If gender is a significant difference, then sexual and social expectations will appear in the emerging patterns. Each significant difference will shape the emergent pattern differently.

The many differences in a system are important to various members of the group at the same time. Also, the differences change continuously as the concerns

and needs of the group shift. A group that focuses myopically on a single difference increases its potential to act in consistent and coherent ways, but it also risks locking itself into a narrow range of responses. A group that cannot agree on a single focal difference, on the other hand, may generate a large number of possibilities, but be unable to gain the momentum necessary to take action on any one of them.

Transforming Exchanges

Transforming exchanges form the connections between system agents. Information, money, energy, or other resources are the media for transforming exchanges. As the resource flows from agent to agent, each is transformed in some way. These patterns of individual change lead, ultimately, to adaptability of the system as a whole.

Transforming exchanges are the third of the conditions that shape the emerging patterns in a complex system. “Exchanges” refers to the contact between agents of the self-organizing system. The agents may be members of the organization, ideas, departments, or customers. When one agent changes, it sends messages in the form of energy, information, or material to its neighbors. The neighboring agents receive the messages and respond to them in the local environment. That response generates more messages that are consumed and responded to by other agents.

Examples of Vehicles to Build Transforming Exchanges

- Face-to-face meetings;
 - E-mail;
 - Delivery of products and services;
 - Financial transactions;
 - Memos; and
 - Phone calls.
-

Transforming exchanges, via any medium, connect across significant differences and create changes in the patterns around which the system organizes itself. When transforming exchanges are insufficient, agents work as disjointed and independent parts, and then coherent, system-wide patterns fail to emerge. Individual agents experience a sense of isolation and confusion. When transforming exchanges

are too strong or too numerous, agents have few degrees of freedom and thus their behaviors are limited. For example, information overload or rigid management practices can produce groupthink and lack of creativity, direct results of immediate and tight transforming exchanges, which prohibit individual decisions by the agents.

Transforming exchanges occur naturally in human systems. Sometimes the natural ones are productive and sometimes not. A change agent can shape existing exchanges or design new ones to optimize the system's ability to transform itself and adapt to its environment. Chapter 2 includes *Method: Feedback Analysis*, which provides a detailed process a change agent can use to analyze and refine transforming exchanges in a system. *Coping with Chaos: Seven Simple Tools* (Eoyang, 1997) also provides tips for establishing effective transforming exchanges.

The Self-Organizing Process

When beginning an engagement with a new client, one of the first things a change agent notices are the clusters, groups, and subgroups that determine what work is done and how it is done. Managers at different organizational levels form active associations that support consistent behavior across the company. Functional divisions, such as research and development, manufacturing, and distribution, have their own internal structures for decision making and action. Informal groups of colleagues form because of shared interests or histories. Sometimes, groups are located at remote geographical sites, and the physical distances shape groups that behave more or less in concert. The organization itself becomes a container that distinguishes it from its customers and competitors. These naturally occurring systems and subsystems shape individual and group behaviors. Within a container, various perspectives are shared, and group identity emerges.

Within and between containers, significant differences shape behavior. In an effective project team, for example, different areas of expertise determine roles and responsibilities of members. Across an organization, differences in strategic importance of divisions may determine which management voices are more powerful. In times of change, differences in seniority may shape how individuals react. In each container, a unique set of significant differences determines the patterns of behavior for individuals and for the group as a whole. Other sets of differences may shape the emergent behavior between containers, affecting the patterns of behavior that emerge in larger organizational containers.

Difference alone does not generate change, however. Team members may be completely aware of their differences, but be unwilling to engage with one another to learn from their various perspectives. When this happens, the system becomes locked in to destructive behavior that exaggerates differences without using its potential for learning and growth. Within a container, the agents become aware of their differences and use transforming exchanges to engage other agents in the system. Such engagement among agents within a container generates new patterns of behavior, new ideas, new products, and innovative ideas for process improvement.

In a transforming exchange, one agent shares information with another. The second listens, learns, is transformed, and shares information back with the first. Over time, this exchange allows the two to build new insights and options that transcend the original differences between them. Through this process, the agents do not become identical to each other. Rather, each learns from the other and discovers new ways to use their differences toward common ends.

In the course of assessment, a change agent should become aware of the existing containers, their internal and external significant differences, and the habits of transforming exchange that have shaped behavior in the past. Based on this knowledge, the change agent can design interventions to shift container, difference, or exchange patterns to alter the path of self-organization in the group.

THE ROLE OF THE change agent is to use an understanding of the evolving patterns to shift the container, differences, or exchanges to affect the self-organizing path, to observe how the system responds, and to design the next intervention.

Although the interventions can be planned and consciously designed to shape self-organizing patterns, not even the most competent change agent can identify specific causes or predict specific outcomes of the actions of any agent in the system. The role of the change agent is to use an understanding of the evolving patterns to shift the container, differences, or exchanges to affect the self-organizing path, to observe how the system responds, and to design the next intervention. The objective of this action-oriented experimentation is to anticipate, adapt, and influence, not to predict or control the behavior of the system. Later chapters in this book describe specific methods for influencing these three conditions of self-organization.

No Condition Stands Alone

It is helpful to think about and work with these three conditions for self-organization as if they were distinct, but they are not. In the real system interactions, all three conditions are intimately linked together. A change in one shifts the behavior

of the system, which results in changes in the other two conditions. For this reason, a change agent can introduce a single intervention that will have far-reaching effects across the system.

Change that took place in an international financial services organization will illustrate how the conditions are interconnected. Originally a North American company, the client had pursued an acquisition strategy to build an international presence. Over a period of three years, they purchased ten companies in Western Europe. Initially, the acquired companies were allowed to pursue their own strategic and tactical plans without much interference from the parent company. The challenge was to help integrate the various organizations into a single strategic unit. On the face of it, this integration process could be viewed as a container problem: Develop a single corporate identity to embrace the various entities.

Implementing this single identity, however, would give significance to a host of differences that had previously been irrelevant. Variations in language, computer systems, and corporate cultures would emerge within the new container.

Building and maintaining the integrated organization required new modes of communication to form transforming exchanges between and among the various parts of the organization. All three conditions—container, difference, and exchanges—were equally critical issues in shaping the self-organization of a productive whole.

One might think that such complicated interconnections would make the job of organization change more difficult, but in fact it simplifies the process. Change agents who are aware of self-organizing patterns recognize that an intervention that affects any of the conditions shifts the corporate dynamic and results in changes to the others. Given this picture of the self-organizing process, one intervention can be used to alter the most accessible of the conditions, with the recognition that the other conditions will be changed as a result.

In the example above, transforming exchanges were the easiest of the conditions to change. All of the corporate partners had cultures of face-to-face communication. Many of the staff and leaders were people-oriented extroverts. Recognizing this common strength, an intervention was designed to increase feedback among all employees. Using technology, the change agent established several online conversations to involve individuals from all of the companies in rich, work-related, problem-solving discussions. These interactions formed foundation on which corporate integration could be based. As individuals and groups across our sample company were connected, they began to identify and resolve their own significant differences and to think of themselves as part of the same, international, corporate entity.

CAS and the Change Agent

The self-organizing dynamic we presented in Figure 1.1 focuses on the containers that hold the system, the differences that focus pattern-forming energies of the system, and transforming exchanges that establish both stability and the potential for change at the individual and organization levels simultaneously. This iterative and adaptive model sets a new framework for a change agent's understanding and activities.

THE CHANGE AGENT can assess the current state of the containers, differences, and exchanges in an organization; select the one condition that is easiest to affect; make an intervention; and evaluate how the other conditions shift in the process of self-organization.

Because of the complex adaptive nature of the organization, all three of the self-organizing conditions depend on all of the others. No one is more causal to the process than any other. The change agent can assess the current state of the containers, differences, and exchanges in an organization; select the one condition that is easiest to affect; make an intervention; and evaluate how the other conditions shift in the process of

self-organization. As the system adapts, the change agent repeats the process to assess, intervene, and evaluate. This experimental and iterative process is the most effective method for a change agent to influence the paths and products of self-organization in human systems.

The model of self-organizing dynamics (Figure 1.1) can be used as a template for an initial scan of an organization (see Method: Self-Organizing Dynamics, p. 20). This template shows how similar patterns appear across all parts of the organization and across all behavioral issues. This helps a client to focus his or her energy on small, immediate changes that can have a large impact.

The CAS framework also generates some assumptions and recommends some actions that directly contradict the wisdom of traditional change facilitation. Table 1.2 contrasts the traditional assumptions about change in organizations with the CAS assumptions that will be explored in the following six chapters.

Table 1.2. Assumptions About Change

Chapter	Traditional	Complex Adaptive Systems
2	Top down	Depends on connections between system agents
3	Groups follow predictable stages of development	System agents adapt to uncertainty
4	Clear goals and structures	Emerging goals, plans, and structures
5	Values consensus	Expects tension between self-similarity and difference
6	Levels of intervention (individual, group, organization)	Self-similarity across system
7	Defines success as closing the gap with a preferred future	Defines success as fit with environment

The rest of this book presents concepts, tools, and techniques to help change agents to work effectively in a CAS.

Summary

The use of rational planned change approaches, driven by leaders with the help of change facilitators, has fallen short even when bolstered by formal (and expensive) programs such as TQM and re-engineering. The root of the problem has been the Newtonian legacy of organization-as-machine.

A new paradigm is needed—one that creates the conditions for fostering information flow, connectivity, relationships, and the emergence of plans from the members of the organization. Such a paradigm has major implications for leaders and change agents. Learning to support these processes and letting go of the need for control and certainty is a major challenge. The building blocks of organizations of the future will be the new effective connections, actual and virtual.

The emerging science of complex adaptive systems offers such a paradigm. It provides metaphors and models that articulate and make meaning out of the emerging adaptive nature of organizations. It establishes a foundation for a new theory of change, which, in turn, offers multiple ways to assess an organization's current situation, intervene to influence, and evaluate outcomes of change initiatives. As a

powerful theoretical model, CAS provides an integrating context for the many innovative tools and techniques that are emerging from the various corners of the change-facilitation field. It meets the need for a model that is simple and complex, adaptable and stable, optimal for individual and organization, ambiguous and articulate, diverse and integrated, revolutionary and strangely familiar.

► METHOD: SELF-ORGANIZING DYNAMICS

Purpose

The three conditions of self-organization can be used to provide an overall assessment of where an organization is in its self-organizing process (see Exhibit 1.1).

Exhibit 1.1. Assessment of Needs for Self-Organization

Conditions for Self-Organization	Totally Constrained System	Self-Organizing System	Totally Unconstrained System
Container	Strong, Small	Permeable boundaries are good enough to let the system self-organize	Weak, Large
Significant Differences	Hidden or None Acknowledged	Differences that are constraining/unconstraining the system are identified and worked through	Many or Every Difference Is Equally Acknowledged
Transforming Exchanges	Many, Top-Down Only, Tight Coupling	Meaningful contacts among agents forming the patterns in the system	Few, Trivial

Preparation

Existing data about the organization can be used for this method, or additional data can be collected through focus group interviews. In meetings with the client, the change agent helps the group organize the data into three categories corresponding to the three conditions for self-organization.

This method is consistent with the model developed by L. Dave Brown (1980). Brown pointed out that overconstrained organizations suppress crucial information, ignore differences, are bound by rules, constrict novelty, and are impermeable to novel inputs. An underconstrained organization is unfocused, unable to identify relevant information, withdrawn from conflict, inefficient, fragmented, and too permeable to disruptive inputs. When in either extreme state, the organization is not able to self-organize; it is either too tightly controlled or too loosely controlled.

Process

The client must determine whether the organization is overconstrained or underconstrained in each of the three conditions (see Exhibit 1.1).

If the organization is tipped toward being overconstrained, interventions to move it toward less constraint will support its movement to self-organization (represented by the center of each continuum). If the organization is underconstrained, it requires interventions to move it toward more constraint—and thus bring it into the realm of self-organization.

As the change initiative moves back and forth on each continuum, the system comes in and out of a state of self-organization. The ideal for a CAS is to match its self-organizing

THE IDEAL for a CAS is to match its self-organizing patterns to fit its environment.

patterns to fit its environment. A nuclear power plant must be on the highly constrained end of the continuum, and day traders have to be at the underconstrained end because their environment is uncontrolled.

Application

The managers of a human resource department had received a low assessment in the annual employee survey and wished to improve their scores. They were under pressure from top management to take action. The consultant conducted focus group interviews and arranged the data in nine themes, which the management group classified in the categories representing the three conditions of self-organization (see Exhibit 1.2).

Exhibit 1.2. Sample Assessment of Needs for Self-Organization

Conditions for Self-Organization	Totally Constrained System	Self-Organizing System	Totally Unconstrained System
Container	Strong, Small		Weak, Large
1. Need for big picture		←	→ ●
2. More focus on work		←	→ ●
3. Clarify roles and expectations		←	→ ●
Significant Differences	Hidden or None Acknowledged		Many or Every Difference Is Equally Acknowledged
4. Develop staff		←	→ ●
5. Ensure equity in rewards		←	→ ●
6. Hold people accountable		←	→ ●
Transforming Exchanges	Many Top-Down Only, Tight Coupling		Few, Trivial
7. Seek out different ideas		←	→ ●
8. Give timely and direct feedback		←	→ ●
9. More direct communication from front office		←	→ ●

The managers agreed that all of the indicators pointed toward the need to tighten up a diffuse underconstrained system. The containers were too large and diffuse for staff to know how management regarded their work. Management had also been ignoring significant differences among the staff over inequities in work assignments and performance. Management had also avoided transforming exchanges with the staff through direct contact. Management was seen as unengaged or uninterested in staff ideas.

With all of the pressures on the management group, they realized that they could not make progress in all areas at once. Knowing that the conditions of self-organization are interconnected, the management team decided to focus on one area, trusting that improvement in one of the staff concerns would favorably impact the others.

The leader of the group chose to improve transforming exchanges, particularly the quality of interaction with the staff. He committed to (1) engaging the staff on specifics of their projects, (2) clarifying how their activities contribute to the big picture, and (3) expressing his own vision of where the group was going. This would shrink the container by building a strong sense of being a team. The leader would address the significant differences in how staff members related to their tasks, and the direct contact with the staff would be a series of transformative exchanges, one-on-one and in small groups.

The management group identified some goals and actions to move them toward the work focus (see Exhibit 1.3).

Exhibit 1.3. Sample Goals and Actions

Goals	Actions
Develop more time to focus on the internal work	Delegate some external tasks to middle managers
Validate HR's vision about the work and build support	Talk to key internal customers
Enhance communications with staff about the work	Monthly meetings; spontaneous meetings; visit work groups
Clear, direct, timely action (from the heart)	Hire executive coach to help with communications
Obtain more suggestions from staff about the work	Set up feedback sessions with work groups

The management group committed to take these actions over a two-month period and to obtain regular feedback on the outcomes of their actions.

After two months the management reviewed the original nine areas of concern from the staff and refocused their change initiative. ◀

The model of self-organizing dynamics illustrates the value of complexity science for the organization change agent. By using the model to focus attention on increasing the capacity of the organization to self-organize, the change agent fosters the meaningful and adaptive interconnectedness of parts of the system. In the next chapter we see how improving connections among system agents leads to organization change.