HUMAN SYSTEMS
DYNAMICS INSTITUTE

The Practitioner's Landscape

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In the Beginning

In the 1980s, when some of us first delved into applications of complexity to human systems, there were no pre-formed models or metaphors to guide us. We dove into the science and mathematics of chaos and complexity, came up gasping for breath, and put together the language, tools, and methods that we thought would be most helpful for ourselves, our colleagues, and our clients. Though the deserted landscape was lonely and intimidating sometimes, it left us free to explore opportunities and to invent tools and techniques to meet the immediate needs as we understood them at the time. It also allowed us to make low-risk mistakes, either in our understanding of the science or in our expectations for its application to real-life human systems. We were a creative bunch and generated an endless stream of complexity-based inventions.

A Rugged Landscape

Today, the landscape is different. Early adapters and inventors have passed through this territory before. They've left a trail of methods, models, languages, and expectations that are not always consistent within each approach and certainly not coherent among the various approaches. Each explorer has synthesized his or her experience, theoretical frameworks, and client's needs to create tools and methods that work in a given time and place. These creations have sometimes taken on a life of their own—being codified and generalized to be applied in other, more distant circumstances. On the one hand, the accumulation of complexity-based techniques makes the work accessible to more people and increases the efficiency and (usually) the efficacy of our interventions. On the other hand, the library of powerful tools can quickly become a graveyard of irrelevant approaches. This emerging landscape of human systems dynamics tools and techniques includes:

- 15% Solution (Morgan, 1997)
- Complex responsive processes (Stacey, 2001)

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- Self-organizing leadership (Knowles, 2002)
- Difference questioning (Goldstein, 1994)
- Metaphorical landscapes (Lissack & Roos, 1999)
- Difference Matrix (Olson & Eoyang, 2001)
- Generative Relationship STAR (Zimmerman et al, 2001)

And many, many more.

Making Sense of the Pattern

Management and organization development professionals are deciding to enter the world of nonlinear dynamics and social systems every day. Newcomers have reason to be confused as more of us are generating and propagating options for complexity-inspired action, as the science of complexity becomes more highly specialized and less accessible to the layperson, and as the language of human systems dynamics becomes more widely used and abused. The result is that what used to be a desert is now a rugged landscape of tools and techniques to help apply principles of complexity science to the challenges that plague individuals, institutions, and communities today.

Patterns of emergence in complex systems would lead us to expect just such a phenomenon—multiple options and diverse environments would generate a plethora of apparently random solutions. Over time, however, the lessons of nonlinear dynamics would lead us to expect that some patterns would emerge to make sense out of the confusing mess. We would expect that local patterns would emerge, "My theories and those of my colleagues are more coherent and useful than others' are." We might even expect that some patterns would emerge to bring shared coherence to several local patterns, "The US approach to complexity includes more tools to support decision making and fewer that focus on relationship building." We might see patterns emerge by discipline, "Organization development practitioners redefine familiar tools of emergence while management scholars and managers focus on complexity-based approaches to leadership and planning." Industries might provide another level at which patterns of techniques form, "Health care applies complexity principles in multiple contexts, while community development focuses on the collective voice of a group." Such statements may or may not be true. I use them here as examples of the ways that we, as responsible professionals and scholars, seek to make sense of the cacophony of tools, methods, techniques, and languages that build bridges between complexity science and meaning and action in human systems.

Not only do we seek for patterns that place one thing in relation to another. We also tend to make one better or worse than its neighbor. Without a fundamental understanding of how these approaches differ from each other, we will find ourselves biased toward those we know and use and biased against (and seeing ourselves in competition with) the ones that are different from our own.

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Differences that Make a Difference

I would like to propose a two-dimensional classification system that, I believe, represents the landscape on which we work as practitioners in human systems dynamics. I began to see these relationships and use them in my own work when I attended a conference in Austin, Texas in the spring of 2003. A diverse group of complexity scientists and social scientists and mathematicians had gathered to explore a shared research agenda for the nonlinear dynamics of social systems. As a group we wrestled with the diversity of ideas and each other and were not able to come to a shared understanding of the work or the questions that will be important to us over the coming years. It was stimulating, but it was also quite frustrating to those of us who would like to encourage more interaction across theoretical and disciplinary boundaries.

On the plane ride from Austin to Minneapolis I pondered the mess we had exposed. I looked for common threads, and there were few. I asked myself, "What are the significant differences? What are the differences that make a difference among this motley crew of searchers?" This question I could answer—at least I thought I could. There were two things that made differences among us:

- What is the phenomenon that I choose to study?
- What are the tools I use to influence the emerging dynamics?

With these two variables in mind, I sketched out the first version of the HSD Practice Landscape that appears in Table 1. The table seemed to cover the whole range of descriptive tools, from the most concrete practice through the abstraction of mathematics. Every human systems dynamics intervention I could think of fell somewhere between these two extremes. The range of phenomena, too, seemed to cover all of the approaches that were familiar to me.

The twelve areas represented on the landscape provide ways to categorize the many options for working with and within complex human systems. Each one represents a class of approaches that can be used to understand and influence complex human dynamics. Table 1 also gives an example of an approach that fits each of the locations on the Practice Landscape. These examples are merely to help explain the options that the Landscape describes. Any one of the areas could include a large number of other interventions or approaches. These examples should help explain the structure and function of the Practice Landscape.

Some phenomena in complex adaptive systems are obvious even to the casual observer. For a variety of reasons, practitioners might choose to focus on these phenomena rather than the more subtle patterns that emerge in self-organizing systems. I've taken this path when my client is new to the field and somewhat skeptical, or when time is short and dynamics are particularly disruptive. Even when focusing on these obvious patterns, I have many choices for complexity-inspired intervention. I can take action to try to influence the dynamics. Gareth Morgan's 15% solution (Zimmerman, 2001) encourages one to take action and observe how that action influences emergent patterns over time. Another option is to name the obvious pattern of behavior using one of the beautiful and descriptive metaphors of complexity, such as the butterfly effect (Wheatley, 1992).

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Moving beyond the language, there are interventions that can shape intervening

action when the metaphors of complexity are taken somewhat more literally. Coupling (Eoyang, 1997) is an example of using the relationships of complexity to shape not only descriptions but decisions in a dynamical human system. Finally, complex dynamics can be captured in simple mathematics when measures, such as the Balanced Scorecard (Kaplan & Norton, 1996), are used to track mutually causal factors in a complex and adaptive system. So, a wide range of options (from action to mathematics) is available when a practitioner needs or wants to affect the superficial structures that emerge in a complex system.

Right below the surface in human systems dynamics are patterns that might be missed by the casual observer. These patterns are accessible to the "naked" eye, but they require training and heightened sensitivity to discern the patterns as they emerge. Some clients and many human systems dynamics professionals can be trained to see these patterns as they emerge. Various tools can be used to help articulate and translate these patterns into meaningful action. In terms of practice, reflection is a method that uncovers patterns that otherwise would be hidden from view. Practitioners use a variety of reflective activities from journaling to guided imagery to help people see emergent patterns in their human systems. Many metaphors can be used to describe these patterns as they emerge. One often used (and sometime misused) metaphor is the strange attractor. "Attractor" presents the image of emergent behavior that has a finite bound and infinite variability within the bound. This language can help a group be aware of and use its inherent patterns of behavior. Stronger metaphors can shape shared action in a group as they become aware of their own emerging patterns. Future Search (Weisbord & Janoff, 2000) is a perfect example of an approach that uses the evident deep structures of a dynamical human system (such as sensitive dependence on initial conditions, self-similarity, coupling, and mutual causality) to bring about organizational transformation. Finally, the mathematics of network analysis (Barabasi, 2002) can be used to make the invisible visible to a group of people seeking to understand their shared dynamics. So, each category of tool, from unspoken practice through weak and strong metaphors and to mathematics, can be used to help articulate the deep structures of human dynamics that are accessible to trained observers.

The third, and final, level of phenomena involves those patterns that cannot be directly observed, even by trained observers. Depending on the dimensionality of the system and/or its stage of evolution, some complex adaptive systems evince patterns that are so deeply engrained and so subtle that they cannot be seen without special tools and techniques. Intuition is a practice tool that accesses these subtle structures. Some gifted individuals can sense a "subtle realm" when it is inaccessible to others or even to a conscious investigation by the intuitive. Open Space Technology (Owen, 2004), a large group meeting facilitation technique, uses the dynamics of complexity to build systemwide patterns of understanding. Open Space depends on simple rules that define the underlying patterns of individual and group behavior, so it gives names for the deep and subtle structures that drive the dynamics of human systems. Computer simulation models generate even stronger metaphors for invisible patterns in human systems dynamics. By representing the systems' interactions and emergent patterns, the simulation can make visible the deep, subtle patterns that emerge from complex interactions. Finally, these subtle patterns can be uncovered by complex mathematical analyses, such as nonlinear time series analysis (Kaplan & Glass, 1995). These

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different types of tools can be used to discover, describe, and influence the deep structures and patterns of behavior that emerge in complex human systems.

These twelve categories of practice, defined by the object of focus and the tools of investigation, provide a rubric to help a practitioner understand the wide variety of complexity-based approaches and to select the one that is most appropriate for a given situation.

Benefits of the Practice Landscape

When one is faced with the multitude of complexity-inspired approaches, the Practice Landscape can provide a variety of benefits.

Choices are simplified without restricting options. When a situation is viewed through this landscape, practitioners have two choices to make. One can view more or less subtle patterns with more or less abstract tools. Focusing on these two variables, a practitioner can focus in on a small subset of tools and approaches that might meet the immediate need.

All options are equally valid. No one part of the landscape is by nature superior to another. In some circumstances you need to deal with the patterns that are already seen by everyone in a group. Sometimes you need to practice your insights about complexity without using the language. In other situations you may be able to use the mathematical tools of complex adaptive systems to demonstrate subtle and surprising dynamics. No place on the landscape is any less useful or true than any other. The only question is, "Which of the options fits your practice environment at a particular place or time?"

New approaches can be envisioned that take a known approach from one domain and finds ways to apply it in another. Likewise, this set of categories can be a framework for personal development as a practitioner recognizes his or her strengths and works to overcome personal weaknesses.

A group of colleagues can use the Practice Landscape to support a planning process. It provides a shared language that acknowledges the power of multiple perspectives while providing meaningful distinctions and criteria for shared decisions.

Challenges to the Neatness of the Landscape

Though it would be nice to believe that the Practice Landscape provides unambiguous order for the messy collection of practices in human systems dynamics, I fear this is not the case. Like most models, this gives one some level of meaning and leaves other questions unanswered. I continue to ponder some of the questions that are either generated or not solved by the Practice Landscape.

Can subtle deep structures and evident deep structures be objectively distinguished? On the one hand, I do see significant differences between techniques that record what can be seen by the unaided and uneducated eye, those that require educated eyes, and those that are impossible to see without the aid of some specialized tool or technique. On the other hand, reasonable people might disagree about what is evident and what is subtle deep structure.

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Is the distinction between strong and weak metaphors a helpful one? The terms are not meant to be pejorative—both weak and strong metaphors can be equally useful. But there is a practical distinction, I think, between using the language of complexity to describe patterns that emerge in human systems and using the principles of complexity to influence or shape the dynamics. This is the distinction I sought to capture in the weak/strong distinction in the model.

Are the number of categories for either the phenomena or the tools sufficient? Are more divisions needed to capture the meaningful distinctions among current human systems dynamics tools and techniques?

Like most useful models, the Practice Landscape introduces a whole new set of meaningful questions that will affect both research and practice in the field. Even before these questions are stated or answered, I have found the Landscape helpful as I develop new tools and techniques, select approaches to support clients, and as I frame questions for myself and my colleagues. I hope you find it useful as well.

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Table 1. Human Systems Dynamics: The Practice Landscape

	Tools for Understanding and Intervention (epistemology)			
Phenomena (ontology)	**Practice**	**Weak metaphors (description)**	**Strong metaphors (explanation)**	**Mathematics**
Surface structures	Act in response to the surface structures of human systems dynamics	Describe patterns that emerge in human systems with metaphors drawn from complexity sciences	Intervene using tools derived from complexity to influence the surface structures of human systems	Represent complex relationships among variables of the surface dynamics of complex human systems
Example	*15% Solution*	*Butterfly Effects*	*Coupling*	*Balanced Scorecard*
Evident deep structures	Act in response to the deep structures of human systems dynamics that are evident when I know where and how to look	Describe subtle structures that shape human system dynamics using complexity metaphors	Influence the self-organizing processes in human systems by shifting the nonlinear dynamics that are visible	Represent the more subtle nonlinear dynamics of human systems using tools of mathematics
Example	*Reflection*	*Attractors*	*Future Search*	*Network Analysis*
Subtle deep structures	Act in response to structures that are so deep within the nonlinear dynamics that I am unaware of what the patterns are	Support a system as it describes for itself the nonlinear dynamics that drive its tensions, productivity, and history	Represent the system dynamics so that the subtle deep patterns are visible and accessible to influence	Use mathematical tools to discover subtle structures in complex human systems
Example	*Intuition*	*Open Space Technology*	*Computer Simulation Models*	*Nonlinear Time Series Modeling*

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