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Leadership Principles and Technologies

The Philosophy of Leadership Informed by the Science of Complexity, Chaos, and Quantum Physics

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Leadership Principles and Technologies: The Philosophy of Leadership Informed by the Science of Complexity, Chaos, and Quantum Physics

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Abstract

Newtonian physics formed the foundation of physical and social science for three centuries. However, the clockwork efficiency metaphor is unwinding in the face of the new science. The principles of the new science shed needed light on the technologies of leadership in modern organizations. This paper outlines four general principles taken from the new sciences and applies them in organization through specific leadership technologies. These principles and technologies provide a better explanation of the leadership phenomenon and a better way to prepare ourselves for the demands of leadership.

Introduction

Using a "clockwork" efficiency metaphor to explain the workings of the universe, Newtonian physics formed the foundation of physical and social sciences for over three centuries (Capra, 1983; Harman, 1998; Wolf, 1989). Now, that metaphor is unwinding. Einstein's relativity and the quantum physics of subatomic particles have denied humankind its aura of mechanistic predictability. The "new science" that is emerging (comprising ideas of quantum physics, chaos theory, and complexity science) marks a potential paradigmatic shift in the physical sciences (Kuhn, 1962 / 1996). Nevertheless, scientists still observe an inherent order in the universe that exists even in the midst of apparent chaos.

Applied to organizational theory and practice, Newtonian principles focused attention on formal groups, hierarchical systems, efficiency, and the rigidity needed to maintain bureaucratic control (Harman, 1998; Morgan, 1998). Today social scientists are recognizing the organizational influence of new science principles and applying these ideas to leadership and organizations (Brown & Eisenhardt, 1997; Dennard, 1996; Epstein & Axtell, 1996; Evans, 1997; Evans, 1996; Gleick, 1987; Goldstein, 1994; Harman, 1998; Kiel & Seldon, 1998; Morcol, 1997; Morgan, 1998; Overman, 1996; Peters, 1987; Priesmeyer, 1992; Rinaldi, 1997; Senge, 1990; Shaw, 1997; Stumpf, 1996; Sweet, 1997; Wheatley, 1992). These changes in thinking are perplexing and, perhaps, even frightening to some organizational analysts. Nevertheless, as elements of this new science become clearer, our grasp of leadership--past present and future--is deepened.

This paper builds a foundation for leadership theory and practice built upon the evolving models of the universe. These concepts affect how we view the structure and arrangement of our social organizations. At least four emerging new science principles can be abstracted from current research. These principles include

autopoeitic systems, paradoxical perspectives and nonlinearity, morphogenic field theory, and fractal organization patterns (see Briggs & Peat, 1990; Holland, 1995; Jantsch, 1980; Kauffman, 1995; Langton, 1989; Waldrop, 1992; Wheatley, 1992; Wolf, 1989). These, and the related leadership technologies[1] outlined in this paper, advance the application of the continuously evolving new science principles to the leadership phenomenon.

Background

These four principles exist in a broader reconceptualization of organizational life. Today's organizations operate in a rapidly changing environment. Traditional social science defined an organization characterized by control, prediction, measurement: by traditional management (see Gulick, 1937; Taylor, 1915; Weber, 1992). The world of organizations has come to recognize the limitations of traditional management theories to fully describe the "hows" and "whats" of operating in a collective environment.

Rethinking organizational metaphors (Bolman & Deal, 1997; Capra, 1983; Gabriel, 1998; Harman, 1998; Harmon & Mayer, 1986; Morgan, 1998; Overman, 1996) from a new science perspective asks us to also revisit the way we conceptualize our organizations. This new way of looking at organizations asks us to concentrate on relationship and culture more than on control and measurement techniques. Just as the tools and principles of the new science has allowed us to see nature in different ways, this new organizational perspective lets us see leadership in novel, more precise ways.

Furthermore, a new science perspective reinforces a potential distinction between leadership and management. Much of the current leadership literature focuses on a differentiation between management and leadership, suggesting that "doing leadership" and "doing management" are two different tasks (Baruch, 1998; Bennis & Nanus, 1985; Burns, 1978; DePree, 1992; Fairholm, 1991; Goldstein, 1994; Kotter, 1990; Kotter, 1996; McFarland, Senn, & Childress, 1993; Nirenberg, 1998; Rost, 1991; Wheatley, 1997; Zeleznik, 1977). Whether or not that distinction truly exists is for another paper. However, in the broad context of thinking about organizations in terms of relationships and culture rather than prediction and control, the new science offers more in terms of organizational leadership than it does, perhaps, organizational management.

The new science has made obsolete much of the underpinning of traditional management theory. Order based on predicable system and procedure is giving way to one keyed to relationships. The question now is what does "doing leadership" mean in the world of complex organizations. New science principles give us a way to better explain the leadership phenomenon and to better prepare ourselves for the demands of organizational leadership. This paper will identify some basic principles found in chaos and complexity theory and offer technologies to apply these principles in our leadership of organizations (see Table 1). These technologies are not necessarily new in leadership literature. Yet linking them to the principles of the new science creates a framework to both understand better the power of these technologies and determine how best to implement them in organizations.

Table 1: Leadership Principles and Technologies

Leadership Principle	Leadership Technologies
Autopoiesis: Information, Interaction and Issues of Trust *Organizations (as open, living systems) have the ability to self-organize if the proper context is preserved.*	• Allowing a Free Flow of Information • Designing Feedback Loops • Maintaining a Relationship Focus • Instilling and Encouraging Trust
Paradox: Confidence Amid Uncertainty and Ambiguity *Uncertainty and ambiguity are a part of organizational life.*	• "Getting on the Balcony" • Fostering Creative Destruction • Seeing All Change as People Change
Morphogenic Fields: The Place and Purpose of Vision and Values *Organizations and the people within them cluster around inherent structural forces.*	• Emphasizing Values • Listening to and Watching Values • Vision-setting • Teaching and Coaching
Fractals: The Power of Simple Patterns *The new science reveals that simple rules and patterns may create complex structures through random (non-controlled), autonomous action.*	• Focusing on Small and Simple Things • Encouraging Autonomous Structures • Recognizing that Qualitative Concerns Matter Most • Developing Stewardship and Delegation • "Counciling With" Others

Autopoiesis: Information, Interaction and Issues of Trust

The new science clarifies how individuals can act independently and still contribute to the orderly and unified purpose of the organization. The concept of autopoiesis (from the Greek for self-production) highlights the power of relationship and interaction in the new science. Erich Jantsch (Jantsch, 1980) defines autopoiesis as a tendency of living systems to renew themselves and regulate the renewal process in ways that maintain the basic integrity of their structure (see also Gleick, 1987; Kauffman, 1995).

The physics of the past asserted that entropy and equilibrium would assert their dominance in all systems, including the universe itself. Goldstein (1994) suggests that the new science concept of autopoieis demonstrates how systems can show an opposite tendency – that they can evolve into states of greater organization, complexity, and order. He notes that each open system (organization) has a unique identity and a clear boundary. However, the organization is not in isolation. The "boundary" of the organization is paradoxically both non-permeable enough to maintain an identifiable nature over time *and* permeable enough to allow environmental conditions to effect it. It merges with its environment, creating a constant ebb and flow of information that enhances the system (Senge, 1990). Organizationally, autopoiesis can be encouraged by a leader using four

technologies: a free flow of information, feedback mechanisms, a relationship focus, and trust.

Allowing Free Flow of Information

In the new science, information is the lifeblood of any open system. Rather than restrict and control information coming from within and without an organization, leaders recognize the importance of free and easy access to information. Information can serve an organizing and evolutionary purpose for an organization (O'Toole, 1996; Wheatley, 1992). Though opening up the lines of communications may be a frightful prospect for some, the pay-off is clear. A sense of community develops which allows for trust and autonomous structures to flourish. The order and self-organizing benefits are being well established by new science principles.

Ensuring Feedback Loops

Self-organization depends upon a dialog between the internal organizational environment and the external environment (Goldstein, 1994; Harman, 1998). As information is freely available, this dialog allows the leader to make continual and honest assessments about the viability, integrity, and structure of the system so that order can be maintained amid change. Such a dialog is often described as feedback (see Weick, 1979). The new science confirms the need for continuous feedback loops to capitalize on creativity, internal organizational culture, and external flows of information and models are being developed to illustrate how organizations can do it (see Rinaldi, 1997).

Maintaining a Relationship Focus

If information is the lifeblood of organizations, then the arteries and veins through which the information flow are relationships. At the subatomic level, the new science teaches us that objects are understood meaningfully only as they relate to others. The new leader must take on a relational slant in all aspects of organizational life, because organizations differ from a mere collection of individuals in that the parts have an influence on each other (Goldstein, 1994; Stumpf, 1996).

The new science is clear that open systems are comprised of elements that *relate* to each other in unique, non-linear ways. This demands the development of trust, inclusion, respect, and a concern for the "whole-soul" of the people we lead (Bolman & Deal, 1995; DePree, 1992; Fairholm, 1997; Weisbord, 1987). The new leader recognizes that *people* are the "parts" of their organization and that relationships among people are the essential building blocks of a flexible and sustainable organization.

Instilling and Encouraging Trust

To lead, leaders need an environment characterized by mutual trust within which the quality of relationships and interpersonal interactions is united (Fairholm, 1994; Fairholm, 1997; Harman, 1998; Kouzes & Posner, 1993; O'Toole, 1996). Such a culture provides both leader and follower with a context in which each can be free to trust the purposes, actions, and intent of others and further the goals of the organization. A trust culture is integral to solving organizational problems and creating new organizations that can cope with the complexities of today's workplace. Kotter and Heskett (1992) confirm this notion. They found that corporations with

strong cultures based on a foundation of shared values and trust outperformed other firms by a huge margin. As leaders infuse the organization with the value of trust, the interactions of group members encourage the self-organization and creativity that autopoiesis suggests can occur[2].

Paradox: Confidence Amid Uncertainty and Ambiguity

Two founders of quantum theory, Niels Bohr and Werner Heisenberg, related how their experiments in atomic physics shook the foundations of science they had relied upon throughout their careers. They observed paradoxes– apparent incongruities, inconsistencies, and contradictions – in the way nature was behaving. They wondered how nature, once so reasonable and predictable, could be so absurd in the atomic realm (Capra, 1983). They saw how classical attempts to measure position and momentum inevitably yields uncertainty in the quantum world because the very act of measuring the particles changes them (in terms of location, speed, etc.) in significant ways. The universe held together somehow, though we were no longer able to measure it as we had before. Physicists finally began to make sense of these paradoxes and ambiguous observations by learning to ask nature different questions and to change their observational perspectives.

In organizational life, we, too, come across paradoxes – things that just do not make sense. This "social" ambiguity may shake the foundations of organizational theory just as deeply as in physics. The classical organizational models of Weber, Taylor, Fayol and the Gilbreths allow for certainty and prediction. But the realities of organizational life are full of ambiguity, uncertainty, and surprise. Organizational theory is just beginning to describe the powerful impact of recognizing, not certainties and predictions, but preferences or principles (Gabriel, 1998; Weisbord, 1987).

For leaders, a level of comfort and confidence with ambiguity is essential (Bolman & Deal, 1997; Cohen & March, 1986). Leaders understand that they influence organizational life; they do not ordain it (Gabriel, 1998; Nelson, 1997). This comfort with ambiguity emerges as leaders learn to ask the right questions – accepting their limited perspective while seeking to gain a higher one. Three technologies may help leaders to become comfortable amid uncertainty and act confidently within organizational ambiguity, using this uncertainty and ambiguity for the benefit of the organization and its people.

"Getting on the Balcony"

Leaders need to put their heads above the flux and see the contradictions that are shaping organizational life even while they are actively engaged it (Morgan, 1998). This is what Heifitz (1994) calls "getting on the balcony" – getting above the day-to-day pressures to see the big picture. He warns that it may be easy to understand, but difficult to do. Seeing the flow of traffic on early morning news traffic reports is a much different experience than being *in* the traffic jam. Heifitz suggests a diagnostic framework to help leaders get "on the balcony": identify the adaptive challenge, regulate distress, direct disciplined action to the issues, and give the work back to the people.

While interventions such as these may have a linear "feel" to them, the new science

teaches us that they may need to be going on at the same time, ebbing and flowing with the cadence of the organization. With this perspective, leaders become more aware of the order found in their organizations, rather than being swept away by the immediately apparent chaos.

Fostering Creative Destruction

Taking from the ideas of Joseph Schumpeter, Morgan (1998) explains that innovation and development are a specific kind of organizational process. Paradoxically, innovation creates the seeds of its own downfall, by creating future areas of competition and, thereby, shaping the need for future innovation in response to the current changes. This he calls "creative destruction" because the very change designed to push the organization towards success, actually begins a new process of improving upon or changing that change. Leaders must recognize that an organization's laudable attempts at innovation sow the very seeds of future organizational change and discomfort. As Morgan describes it, an organization must be willing to "innovate in ways that will undermine current success so that new innovation can emerge" (p. 252). Leaders who understands this cycle, will encourage a level of uncertainty and change. At the same time, they will foster confidence that change and development is helpful to the overall organization.

Seeing All Change as People Change

Many, in their efforts to implement change, emphasize the plans and strategies more than the human resources needed to accept and implement the change. This human side of change is as uncertain and ambiguous as the diversity of the workforce. Helping individuals cope with transition (Bridges, 1991) and profiting from the potential creativity emerging from it, leaders can help followers experience organizational change in productive, rather than disruptive, ways. Just as creative destruction allows us to cope with innovation and understand the possible obstacles to it, understanding how people cope with change allows the leader to remain confident and comfortable with a variety of individual reactions.

Fields: The Place and Purpose of Vision and Values

An important concept in the new science is the idea of morphogenic fields – invisible forces that structure space or behavior. Scientists use field theory to explain the connections they observe between apparently disparate and nonlinear activities. In a broad sense, field theory helps us understand the implicit interconnectedness of the universe, helping us understand how it all works together and how we can work within it (see Sheldrake, 1988). Stumpf (Stumpf, 1996) concludes that *seeing* the order may not be as crucial as knowing it is there. However, elements within a field do shape themselves and behave in distinct patterns. These patterns are called "attractors."

The idea of attractors in the organization is very compelling for the organizational leader. It defines the context that constrains the behavior of a system – like a thermostat controls the temperature in a room within a comfortable zone (Goldstein, 1994; Morgan, 1998). It helps leaders understand the power of ideas like vision and values in setting and altering organizational contexts or cultures. Field theory and attractors let us understand what, for example, a vision

can do in an organization. It shows how a compelling vision or a common set of values held by an increasing number of individuals can ultimately shape the context of interactions and perspectives.

Complex systems, we find, react differently to influences depending upon which context may dominate. A vision, then, thought of as a field of unseen connections that influence people's behaviors, shapes and bounds behavior (Wheatley, 1992). Visions are always present (either in the foreground or the background) and become the articulation of who we are, what we care about, and why we do what we do. A vision wraps the organization in a value-laden field within which individuals view themselves and others in a certain way and act consistent with the value contexts. People connect with an organization as it helps unify beliefs that fit into the underlying cultural contexts (Herzberg, 1984). Leaders make that connection. In this sense vision setting involves more than articulating a desirable future state. Visions give meaning and purpose to organizations (see Bennis & Nanus, 1985; Drath & Palus, 1994).

Leaders understand vision not as a description of an organization's desired future state (it's mission), but rather as a statement of what makes the organization what it is – its essential nature – so that the organization can discover where it may go in the future. The new science concepts of fields and attractors highlight another set of leadership technologies: an explicit and pervasive values-orientation approach to organizational action, proper vision-setting, and an ability to teach or coach others in the context of the vision and values.

Emphasizing Values

The need for a clear statement of values becomes vitally apparent as we understand the power of vision. Most of the work on organizational values says that values determine (even dictate) individual and organizational behavior (Fairholm, 1991; Gardner, 1987). A person's values-set has a powerful influence on the way they perceive and act in the world. Therefore, values and vision are inextricably linked. Both intend to impact individual behavior and perceptions.

Leadership asks leader and follower to deal with each other on a values-basis (Bennis & Nanus, 1985; Burns, 1978; Conger, 1991; Cuoto, 1993; Fairholm, 1991; Fairholm, 1994; Fairholm, 1997; Gardner, 1990; Bolman & Deal, 1997; O'Toole, 1996). Not only do leaders themselves need to have a clear set of core values, but they also influence and shape those of followers. Whether they explicitly share with followers their core beliefs and values or not, the leader's behavior expresses a personal philosophy and value-orientation that they bring with them to the organization (DePree, 1992; O'Toole, 1996). Leaders and followers must be comfortable with a values connotation in the work they do, because leadership depends upon it.

Listening To and Watching Values

An essential element of leadership is developing the ability to grasp the core beliefs and values *of others*, the followers. Leaders do this the same way followers learn the values-sets of their leaders – they listen and watch. Leaders engage in naïve listening (Fairholm, 1991; Fairholm, 1994) where they listen as if it were the first time they heard what they are hearing. It is an active process of respectfully attending to what the speaker wants to communicate.

Listening to followers is not just a common courtesy nor a management gimmick to obtain compliance. It is an essential skill leaders must acquire to ascertain the core values of others and to gauge commitment to a set of organizational values and an organizational vision (O'Toole, 1996). Watching is also important – not the supervision required to oversee process compliance – but rather the discerning observation of how people operate and relate to each other over time.

Vision-Setting

Once a values orientation is accepted and adopted, leadership requires that those values be translated into a vitalizing vision – an organizational field, a strange attractor of perception and action (Harman, 1998). Two main methods have been devised to create a vision: by either the leader or the group. Those that rely on group consensus usually end up with a statement of aggregated interests that points more toward a mission for the organization than a statement of the essential nature or attraction of the group. While followers may help, ultimately a leader is responsible for articulating a vision that group members validate. In a real sense, a vision is the leader's perception of the inherent order of the organization that followers come to accept and adopt.

The technology of vision-setting as a whole involves five important components (Fairholm, 1991; see also Sashkin, 1989): leader preparation, scanning the forces of change, creating the vision, sharing the vision, and marshaling action. These components take leaders from a personal discovery of their own inner convictions, to relating their values to the organizational setting and the values of others.

Teaching and Coaching

Sharing the vision and marshalling action are essential for making the organizational vision stick in an organization. Leaders must teach and coach followers to both accept and apply the vision and values connotation of the organization into the work they do (O'Toole, 1996). In a leadership context, teaching and coaching are focused on a very few goals (Fairholm, 1997): helping followers understand the vision and its values context; accept as their own these values and the implications of the vision; and apply the principles inherent in the vision as they perform their organizational work. In this way, the inherent field of the organization becomes more explicit and the order, productivity, and unity that emerge from the attractor become a practical extension of a shared values context. If a leader does not teach his or her values and vision, other values and a different vision will guide the organization and may work against the leader's purposes.

Fractals: The Power of Simple Patterns

To fully appreciate the influence of values and vision in organizations, we must appreciate the concept of fractals. Fractals are pervasive in nature. In the world of mathematics, fractals appear as repeated iterations of simple non-linear equations. We recognize fractals more readily as we look at circulatory systems, broccoli, and fern leaves (see figures 1 and 2). They all replicate a dominant pattern at increasingly smaller levels of scale – a "simple

organizing structure that creates unending complexity" (Wheatley, 1992, p. 132).

Figure 1: A Geometric Fractal

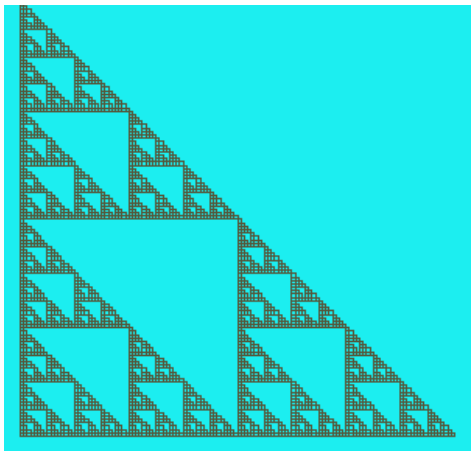
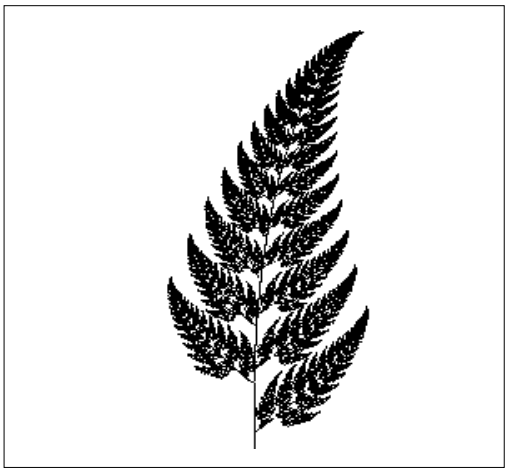


Figure 2: A Natural Fractal



Classical hierarchy asks for rules, regulations, and strict authoritative controls flowing from legitimate power sources. In contrast, fractal organizations form through independent repetition of patterns emerging from vision and values that create an organizational field. Fractal organizations are unique because a simple organizational concept, repeated at different levels of the organization, has the ability to yield order in what may eventually become a seemingly chaotic and very complex organizational system.

Everyone comes to think and behave in ways that are similar to each other, because they are influenced by the organizational vision-field, attracted to the same goals and values, and allowed to act for themselves in fulfilling organizational tasks. The parts of the system (the members of an organization) act independently, but are drawn to an identifiable pattern of behavior shaped and bounded by the values and vision of the organization.

Members trust each other to work for the good of the organization because they all buy into its purposes and values and are shaped into effective representatives (or representations) of the organizing principles – the vision and values – of the organization. In such an organization, true delegation of authority *and* responsibility – where leadership is repeated throughout the organization – becomes a natural and essential part of the organization.

The principles of fractals relate to distinct and implementable principles of organizational design and structure. But they require a different perspective. Whereas autonomy and order are most often pitted against each other in organizations (i.e., controlling the employee so that they do what the organization wants them to the way it wants them to do it), the new science proposes that autonomy and order are and should be partners in creating viable complex systems – what Morgan (1998) may have intended in his discussion of "holographic organizations[3]."

Five technologies for leadership emerge from an understanding of fractals. All deal with both culture and structure. This point, in itself, is an important lesson from the new science – form flows from substance and

substance flows from form. Culture and structure are not independent and discreet, but rather integrally linked in successful organizations.

Focusing on Small and Simple Things

An insightful principle of fractals is the non-linear notion that from small and simple things can come great and complex things (even organizations). Instead of searching for cause and effect activities that always seem to yield unintended consequences, the new science suggests we recognize that the non-linearity of organizations requires a different perspective and allows for a simpler way to encourage radical and creative change (Gleick, 1987; Goldstein, 1994; Wheatley & Kellner-Rogers, 1997). A paradox emerges that says the simplicity of an organization lies within its complexity, and the complexity of an organization is found in its simplicity.

Leadership may be more about shaping rules and patterns than about direction and control (see Waldrop, 1992; Wheatley & Kellner-Rogers, 1999). Standard operating procedures and policy manuals may not be the tools of leadership. Rather, short, simple statements reflecting the values and vision of the organization should be the focus of the leader's communication. Leaders must have confidence that complex behavior can and does emerge from few and simple guidelines that are interpreted and adopted by followers working in an organizational field. This freedom of the follower is discussed more fully in the next technology.

Encouraging Autonomous Action

Leaders must learn to view autonomy and creativity in a new way. Some managers view autonomy as being one step away from anarchy (Wheatley, 1992). However, what we learn from the new science is almost the exact opposite. Leaders must allow people to be the individuals they are, because they really cannot do anything about it. If we try to restrict freedom of action and choice in an organization (by excessive rules and regulations, for instance), organizations are doomed to fight the constant battles many face today – redirecting, resolving conflict, refocusing, and reorganizing. Leaders must allow for individuals to be creative and make choices on their own so the organization can learn and grow along with the people that make it up. The inherent order we find in apparently chaotic organizations emanates from the actions of the individual members of the organization who act in a consistent, self-referential way. Instead of whirling off in different directions, each part of the organization remains consistent with itself and with all other parts of the system as it changes because of the organizational field (the vision) that bounds and shapes behavior.

Stability, it seems, is found in freedom, not in control (Goldstein, 1994; O'Toole, 1996; Stumpf, 1996; Wheatley & Kellner-Rogers, 1999). The paradox is that the order we seek in organizations comes as the parts of the organization are allowed to be independent in their interactions and in the way they choose to act. The key is that the autonomy and individuality are linked to the values-laden organizational vision-field. Leaders should find the fractal predictability linked with self-determinism attractive. Simple rules followed freely can yield complex behavior; on the other hand complex rules can yield simple (or simplistic) behavior. While this may seem

paradoxical, complexity science teaches us that it may by more accurate. The next technology explains how the leader copes with such a system of work.

Recognizing that Qualitative Concerns Matter the Most

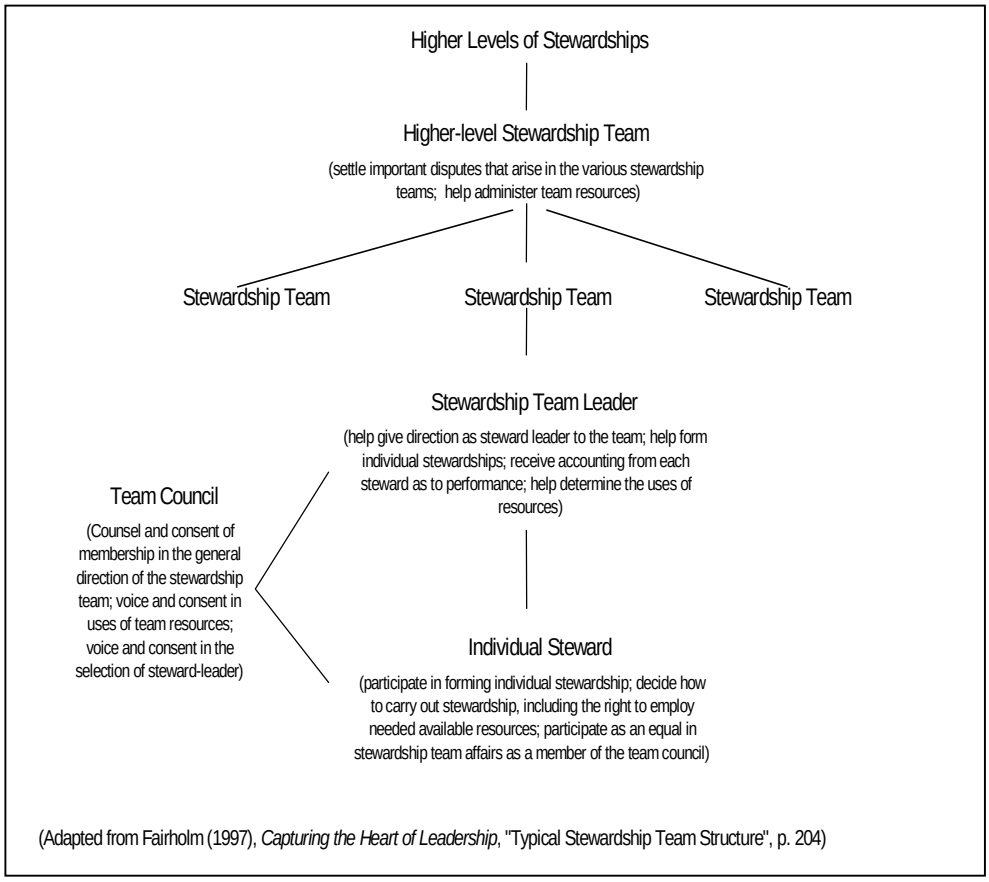
Fractals teach us that leaders may need to focus on the qualitative aspects of the organization more than they do the quantitative measures. In other words, the contemporary focus on measurement, control, and predictability may need to be subordinated to a more "holistic" analysis of the organization. Although we can identify a fractal's shape and influence, it is impossible to predict its exact quantitative properties[4]. The quality of the system – its shape, its complexity, its uniqueness, its values, its vision – becomes important beyond our attempts to quantitatively measure it. If we are caught in the reductionist effort to measure ever more discrete parts of the system in order to improve it, we will never fully appreciate the organization as a whole or its potential for the future and we may stifle the creativity and autonomy essential for success. Of course, we need people to measure and control some aspects of our organizations, but the leader's job is to be attuned to the qualitative factors. These are the things that make an organization what it is and what it can be.

To do this, leaders must learn to measure what can be measured and not measure what actually cannot be measured. Leaders recognize the very essence of the organization is not the map, or the organization chart, or the financial statement, but rather is made up of the intangibles and unmeasurables of culture and vision and values. This technology of leadership requires leaders to let go of counting and control and concentrate more on the feel, the sense, the essence of the organizations. Leaders understand this and learn to "get the pulse of the organization" by walking around, talking to people, observing operations and enjoying the interactions. In this way, the need for control and prediction is tempered by a confidence in the organizing principles of vision-fields, simple rules, and individual agency. This is the foundation for the next technology.

Developing Stewardship and Delegation

Managers rely on control, prediction, and ownership. Leaders, however, take a different perspective. They understand the idea of stewardship and its organizing power (Block, 1993; Fairholm, 1997; Greenleaf, 1977). Stewardship connotes holding resources in trust for a temporary period of time for the good of the stewardship's unit. The idea of stewardship sheds needed light on the oft-mentioned idea of empowerment. An organization based on stewardship principles expresses simple expectations of behavior (values set) and allows members the freedom to assert themselves towards accomplishing mutual goals. Members see themselves as essential to the organization's success and free within their stewardship responsibilities, unfettered by undue oversight, regulations or control. This does not mean that hierarchy no longer exists. The paradox is that hierarchy is used to relinquish control, not to hoard the financial, human, and informational resources of the organization (Goldstein, 1994). Order flows from these principles to create a structure made up of individuals who act within a vision-field, independently following a few simple rules within a context of stewardship (see figure 3).

Figure 3: A Potential Stewardship Team Structure/Model



"Counciling With" Others

Counciling-with followers is a new insight into the relationship between leader and follower and is essential for the stewardship model of delegation to flourish, even when followers are not fully prepared or the environment is in flux (Fairholm, 1991; Fairholm, 1997; Fairholm, 1998). Sitting-in-council-with-followers puts the leader and follower together in an equal, sharing relationship, both committed to the stewardship at hand and both caring for the values of the others. Ideas flow freely among the team as influence shifts from member to member. Ideas, methods, problems, solutions may all be proposed or altered by any or all members.

The *counseling* role of typical "leaders" is unilateral action taken by the counselor toward the other person. In a word, counseling is telling. *Counciling-with* followers is rather finding out together what is right, proper, and needed. Followers become advisors and leaders learn from the followers (Fairholm, 1998). This shared approach is often discussed in terms of participatory or democratic approaches to management. The practical application of this technology makes more organizational sense as we understand the principles of the new science and create stewardship structures in our organizations. This technology is based on relationship and meaningful interactions – the essential elements of leadership.

Summary

New science principles provide a better explanation of the leadership phenomenon and a better way to prepare us for the demands of leadership. The principles and technologies outlined in this paper are summarized below:

- For leaders, having followers organize themselves and work in harmony towards mutual objectives is the ideal. The followers grow and develop as does the organization when there is enough information, significant feedback, and a focus on the quality and effectiveness of relationships built on trust.

- When leaders get on the balcony, understand the creative destruction cycle, and lead people through transitions, the ambiguities of organizational life become less mysterious. The key is to learn to ask the right questions and remain open enough to learn that the apparent paradoxes and the twists and turns in organizational planning are valuable lessons that help us move closer to our goals.

- Leaders realize that values are the basis of organizational vision and that vision, when adopted, is the organizational field that shapes individual and organizational action. They emphasize, teach, and make explicit the values of the organization. They develop a vision that is essentially connected to what the organization stands for. Leaders know that allowing the organization to work within this visionary field will yield productive, efficient, and desirable outcomes, consistent with the implicit order of the organization.

- Leaders understand the role of relationships and meaningful interactions. Applying the principles of fractals to our organizations, leaders dismiss the fallacy that total organizational control is possible, while retaining the idea that leadership has a very significant role to play in shaping and guiding individual and group behavior. Using a vision field, leaders adopt a few simple rules and encourage independent implementation of those rules, while shaping the over all feel and structure of the organization, confident that the organization (and the individuals within it) will flourish and grow. Counciling-with others ensures that the organization members are contributing to the success of the organization and interacting in appropriate and useful ways.

Wheatley (1992) suggests that being able to trust something as simple as a clear core of values and vision, kept in motion through continual dialogue, can lead to order. Her summation encapsulates much of the leadership ideas outlined above: confidence amid ambiguity, values, vision, true delegation, trust, autonomy, relationship, a concern for the quality of the system, and so forth. The new science demands that physical scientists become more comfortable with uncertainty. It also affirms that the uncertainty and chaos seen in social organizations is natural (Overman, 1996). We are also assured that it is possible to use the inherent complexity of our organizations to our advantage. What is needed is leadership that is better informed about the principles of the universe and better equipped with the tools and technologies of complexity.

Endnotes

[1] For many the word technology has a machine orientation. In its fullest sense (the usage here), technology is the way work is accomplished. One definition is "the practical application of knowledge, especially in a particular area." Another is a "systematic treatment of an art."

[2] Lao Tzu, thousands of years ago, gives is insight into these technologies: "The wise leader does not intervene unnecessarily. The leader's presence is felt, but often the group runs itself. …Remember that you are facilitating another person's process. It is not your process. Do not intrude. Do not control. Do not force your own needs and insights into the foreground. If you do not trust a person's process, that person will not trust you. Imagine that you are a midwife; you are assisting at someone else's birth. Do good without show or fuss. Facilitate what is happening rather than what you think ought to be happening. If you must take the lead, lead so that the mother is helped, yet still free and in charge. When the baby is born, the mother will rightly say: 'We did it ourselves!'" *(Heider, 1985)*, p. 33)

[3] Though not discussed in detail in this paper, the building blocks of holography and the concepts of fractals have many similarities. Morgan's model of holographic organizations builds the "whole" into the "parts" of an organization through vision, values, and structures that reproduce themselves; it emphasizes the importance of redundancy in the processing of information and the skills and design of work; it includes the requisite variety that the external environment seems to have; it defines "minimum specs" – no more than is absolutely necessary; and it learns to learn through environmental scanning, feedback and emergent design. For more information on holography and the new science, see Fritjof Capra's (Capra, 1991) *The Tao of Physics, 3rd edition*.

[4] The significance of qualitative over the quantitative assessment may become clearer by asking the question that Benoit Mandelbrot's, the man who discovered fractal geometry, asked his students: "How long is the coast of Britain?" They discovered there is no final answer: the closer you zoom in on the coastline, the more there is to measure. Every nook and cranny has its own nooks and crannies and the organizing patterns of the coastline repeat themselves indefinitely. Though they couldn't accurately measure the coastline, no one argued that Britain did not exist.

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