

Living leadership: the dance between chaos and stasis. A guide for complexity leaders

"I never had much faith in leaders. I am willing to be charged with almost anything, rather than to be charged with being a leader. I am suspicious of leaders, and especially of the intellectual variety. Give me the rank and file every day in the week. If you go to the city of Washington, and you examine the pages of the Congressional Directory, you will find that almost all of those corporation lawyers and cowardly politicians, members of Congress, and misrepresentatives of the masses -- you will find that almost all of them claim, in glowing terms, that they have risen from the ranks to places of eminence and distinction. I am very glad I cannot make that claim for myself. I would be ashamed to admit that I had risen from the ranks. When I rise it will be with the ranks, and not from the ranks".

Eugene V Debs. Labour Organiser and Political Activist.

The Canton Ohio Speech, June 16 1918

(Source:http://www.thirdworldtraveler.com/Socialism/E_Debs_Canton_OH_1918.html)

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The most alarming disease of the 20th Century was not AIDS. It was the CEO disease – a virus that debilitated CEOs and senior management as they strove to steer an organisation through the turbulent waters of mergers, acquisitions, downsizing, growth and expansion . As it spread rapidly throughout organisations, the symptoms of this disease manifested in a multiplicity of ways.

This paper will:

- explore the notion of classical or traditional leadership within a corporate environment – a style of leadership anchored in the modernist project. The CEO disease and its symptoms will be probed.
- rethink the notion of leadership from a postmodern, complexity perspective. There is often a sense from the literature that the postmodern condition and complexity are different stories, but complexity is a perfect description of postmodernism. When we explore the postmodern condition, we are located in the story and voice of complexity.
- using the lens of complexity, provide a guide for complexity leaders. This guide will explore how complexity concepts such as autopoiesis and fractals can be understood from a leadership perspective and provide the leader with a heightened sense of awareness of the meaning of leadership within a complex adaptive system (in this case, the business environment). This enhanced awareness and intuition will allow the leader to dance between chaos and stasis.

The complexity leader should provide guidance, mentoring and coaching (not management or control). Rather than blindly relying on things to unfold, the complexity leader assists emergent processes, provides opportunities for employees (autonomous agents) to interconnect, and provides a supporting, nurturing environment for employees. Without this guidance, the business ecosystem will descend into chaos.

Analogously, should the leader have an iron grip and insist on compliance with rules, regulations and polices, the organisation will

enter a state of equilibrium or spiraling death and, in order to survive, agents will resort to survival tactics such as competition and hoarding of information.

The guide developed in this paper will provide a framework for complexity leaders who, by the nature of their role, must dance between chaos and stasis.

- the complexity leader guide developed in this paper will surface one of the most important aspects of complexity leadership – acknowledging and working with paradox. Whilst the old management paradigm sought to eliminate paradox by insisting that leaders have all the right answers and a unified, fixed strategy or meta-narrative (akin to "God is the answer to everything"), complexity leadership allows for paradoxes – the need for structure yet less structure; leaders 'know' but also guide into the unknown; leaders have authority but not control; leaders explore possible future scenarios without committing to one, fixed reality.

This is paradoxical leadership which dances and fluctuates at the edge of chaos.

The modernist notion of leadership – the fatal flaw

20th Century business literature raised the debate over what it means to "be a leader". The impetus for this debate was the fundamental shift that took place in the mid to late 20th Century from an agriculturally based, mechanistic economy to a knowledge economy (Drucker, 1968).

Prior to this shift, the modernist organisation and management techniques were founded on Taylorism and Newtonian scientific notions. Taylorism, which can be traced to the father of scientific management, Frederick W Taylor, reduced the management of a factory, farm or office to component parts that were organised along hierarchical lines for maximum efficiency and

productivity. This resulted in the 'machine' metaphor, which viewed a company as a machine made up of parts that could be analysed and replaced. The time and motion study was a direct result of "Taylorism". The Newtonian scientific narrative prevalent at the time was a perfect companion to Taylorism with its mechanistic/clockwork view of the world (Nonaka and Takeuchi, 1995).

Employees made sense of the modernist organisation by adhering to the unquestioned assumption that the organisation was in a state of stable equilibrium. The system behaved in a regular, repetitious or predictable manner. If it was rocked momentarily, it would return readily to order and safety. Further disturbances could be identified by scanning the environment (a flat, predictable landscape), planning and taking decisive action ahead of time to mitigate these disturbances (Stacey, 1996).

The CEO and top leadership roles were described in a variety of ways: the leader as social architect; the leader as visionary setting direction; the leader as designer of strategy; the leader as extraordinary individual born to the role (and often mislead eg Hitler); the leader as charismatic personality who was capable of developing an almost cult-like following.

Leadership was paternalistic and often based on wealth, status, class and ego. Organisational leadership involved unrealistic expectations being placed on the role and increased business prosperity and profits was the major business goal. This traditional notion of leadership resulted in the linear process of:

- **Planning:** identifying, selecting and prioritising goals and objectives ahead of the circumstances and conditions which would later emerge and unfold
- **Organising:** assigning job responsibilities and authority for the identified tasks
- **Staffing:** recruiting employees based on fixed-in-time job descriptions

- **Directing:** coordinating employees and ensuring that company policies and procedures are being complied with
- **Controlling:** monitoring and measuring activities, correcting, re-directing

In this paradigm, leadership equated to management, which was described as the simple function of attaining business goals in an effective, productive and efficient manner following the linear process outlined above. Adherence to this management paradigm usually resulted in institutional rigidity and disintegration. The poster slogan for this paradigm was Unfreeze/Change/Refreeze (Daft, 1999).

Cast aside was the employees or agents who were seen merely as cogs in the wheels of business and who had no leadership responsibilities. In order to survive, disempowered agents resorted to survival tactics: competing with each other for promotion or the CEO's good favour; hoarding information or refusing to share lessons learned; avoiding change; superficially complying with organisational strategy or vision; wasting energy by continually bumping into each other or stepping on top of other agents. (Brown and Eisenhardt, 1998).

The fatal flaw of the modernist notion of leadership was the concept of the indispensable leader - a person who viewed the organisation as an extension of his/her personality and shadow. The leader was equated with the mythic heroes of Greek mythology who led battles and conquered territories. Recall to mind US President Dwight D Eisenhower, a WWII hero, who led the United States in the 1950s or President John F Kennedy, also a WWII hero, and US President in the early 1960s until he was snatched from the leadership stage by Lee Harvey Oswald's bullet. Both these figures were cast as "Great Men" who had vision and were capable of motivating citizens to achieve the vision (witness Kennedy's call for a lunar landing to be achieved by the end of the 1960s).

Powerful corporate leaders like Lee Iacocca of Chrysler or Jack Welch of General Electric fame pursued corporate strategy with single-mindedness and "I" centred micro-leadership techniques, often rejuvenating a flailing company, but at the same time, insinuating that leadership transcended the minutiae of precise procedures, company policy and the like. Such success, more often than not based on the attractor of personal charisma, led to the questions of whether common traits or characteristics of leaders could be isolated and whether one was born to leadership or, conversely, could learn leadership skills (Daft, 1999).

Like the search for the proverbial Golden Fleece, common leadership characteristics were identified which equated 'leadership' with the ideal of the philosopher/king. The systems thinking approach to leadership, exemplified by Peter Senge, is a good example. Senge identified five leadership or learning disciplines important to those who would lead: systems thinking, personal mastery, mental models, building shared vision and team learning.

This suggested that the leader needed to develop communication skills, align personal behaviour with values, be adept at listening, and appreciate other's ideas. It also suggested, quite wrongly, "leader as designer or scientist" of the learning processes for the organisation and the ongoing design over time of the system. External to the system, the leader posits a certain strategy or vision, implements, measures and imposes meaning and sense on the organisation and its agents (Senge, 1990).

The systems thinking notion of leadership or learning organisation theory of leadership, coupled with the Great Man approach, suggested that leadership is an autonomous pursuit – leaders make themselves – by contemplating inwardly and obtaining personal mastery of one's energies and being able to see objectively. Senge, in particular, sought the roots of leadership in a mix of Eastern and Western theory and spiritual traditions.

The great management thinker of the 20th Century, Peter Drucker, confirmed this "self-made leader" notion when he famously quipped:

"Eisenhower, George Marshall and Harry Truman were singularly effective leaders, yet none possessed any more charisma than a dead mackerel".

(Drucker, 1981, p6)

However, these notions of leadership, including systems thinking, are anchored in the long-held Kantian philosophy of the autonomous individual and the Western celebration of the individual and the triumph of ego, which replaced earlier narratives of God as centre-of-everything.

Although the German philosopher, Immanuel Kant, considered over two centuries ago that humans, as autonomous individuals, are free to act and are part of nature, he argued that humans could not be understood as parts of a whole or system because, in having souls, we are free to choose whether or not to act according to some universal law or ethical principle. (Kant acknowledged that nature consisted of parts and in the interaction of these parts, the whole emerges. But akin to Senge, Kant viewed a system dynamically unfolding a form, which the observer (agent, scientist etc) could design, hypothesise over, test and measure. That is, the autonomous individual as external to the system and choosing to participate or adhere to universal principles (in business terms, vision and mission statements, corporate values).

The elevation and celebration of the individual by Kant, along with the rise of 20th Century psychology and Western consumerism, led to the modernist notion of leadership – leader as designer and hero; leader as all-powerful creator of vision and mission; leader as architect designing learning agendas; leader as decision-maker steering the one true course for the organisation; leader as sense-maker who constructs and imposes the organisational narrative (Griffin, 2002)

This is the CEO and top management disease. It is a misinterpretation of reality to view leadership as revolving around one person, however charismatic or giving. It is a misinterpretation of how an organisation works –

an organisation is a business web of harmonious and conflicting relationships, connections and disconnections. It is a living network. An organisation has a visible and invisible structure. The visible or legitimate structure is comprised of the business goals, strategy, values, procedures, policies and forms; whilst the invisible structure is the reality - the shadowy corridors which reverberate with the rich and often messy stories and experiences of agents; the employee narratives which co-create new directions and meaning and which the leaders of the legitimate system cannot know (Ward and Sbarcea, 2002).

I suggest that as people operate and move within the shadow system - as they flow through the gray areas that are the gaps between the boundaries prevalent in any organisation – leadership emerges spontaneously from agent interactions. Unknown and unexplored dimensions, which exist outside and in between organisational boundaries, are located and surfaced.

The modernist notion of leadership, however, led to a bifurcation. The leader was "split" from the corporation and elevated to an exalted status. Employees worshipped at the altar of charisma and power. The leader, seen as prophet and priest, transcended the ordinary, everyday interactions of agents. The corporate CEO and top management often occupied luxury offices and took home salaries the average agent could only dream of.

Mission statements, corporate values and strategy were designed atop Mt Sinai – the expensive weekend retreat senior management whisked themselves away to. On returning to the organisation, leaders pondered over the glaringly apparent disconnect between corporate and employee values. As employees tossed the elegantly printed and framed "corporate values statement" into the rubbish bin, leaders shook their heads in puzzlement.

Yet, a leader is part of the whole and participates in the evolution and regeneration of an organisation. This is a "both/and" perspective – a perspective which the 20th century, modernist corporation could not embrace with its reliance on "either/or" (either you were a leader or you were a follower).

At the close of the 20th Century, organisational leaders and agents were tired and cynical. Employees felt betrayed by CEOs who departed the company with well-stuffed pockets. The search for leadership characteristics was exhausted with the grand old man of managerial thinking, Peter Drucker, declaring:

"Leadership personality, leadership style and leadership traits do not exist".
(Drucker, 1996. p.xi)

Perhaps the best summation of the modernist leadership paradigm is:

1. *Design a message that is inconsistent*
 2. *Act as if the message is not inconsistent*
 3. *Make the inconsistency in the message and the act that there is no inconsistency undiscussable*
 4. *Make the undiscussability of the undiscussable also undiscussable*
- (Argyris, 1992. p141)

Old paradigm leaders, struggling to keep the ship afloat, did not listen to the disempowered voices of corporate agents who generated narratives to help them live with their inability to surface tensions, conflicts and alternate realities and stories. Paradoxes were buried; critics of top management were silenced.

The propping up of an artificial, unnatural structure by a CEO or top management is paralleled when we look at leaders of countries. The former Soviet Union disintegrated when Gorbachev valiantly attempted to restore the natural order of things:

"It could be said that the Soviet people were betrayed by their leaders. Why? Because ideological commitments and all-consuming interest in protecting power were always paramount to those leaders – stifling their ability to see things...."as in themselves they really are". Although they possessed often superior information

and much more of it, the Soviets could not put it sufficiently to their larger advantage. They won battle after battle but lost the war. Rarely did Stalin receive information that he might not like. Rarely was the social and political reality of the West portrayed to Soviet leaders for what it was. Most often Soviet leaders would be told what they wished to hear and would see what their ideology told them they must. When Gorbachev attempted to reverse this, the system fell apart". (Brent, 1997. pxxv)

Far from certainty and equilibrium the notion of leadership has a very different meaning. Before we explore leadership through the complexity lens, the following Table 1.1 will serve to summarise some of the qualities and activities complexity leaders **will not need** to follow or aspire to:

Boot camp values	Old values of unquestioning submission to authority of leader; disempowerment of agents; planning leads to predictability; nature of unknown is feared; vertical/hierarchical structure; cultural homogeneity; only top hierarchy has voice; checking, control & surveillance mechanisms; management theory X, Y or Z; command control
Ego/self-centredness	Only the leader shines; has voice; has authority; has power. Deny all other corporate realities and voices.
Deniability	Leaders deny or ignore that lack of trust is inherent in the organisation; leaders implement fear-based controls; impose layers of bureaucracy which confound agents; deny paradoxes exist

The golden rule	He/she who has the gold makes the rules; high salaries and perks do not make the leader - leaders do not show their privileges
An iron fist	Leaders reign by terror or personal charisma; they speak of cutting costs, people; they utter threats

Table 1.1 Qualities the complexity will not need in the new paradigm. (Source: adapted from Daft, 1999, p 16)

The new reality for leadership

The old management paradigm continues to exist in contemporary organisations. Complexity science, however, provides us with a new framework through which we can rethink what leadership means and involves. It is important to acknowledge that complexity science expands and strengthens existing, traditional models of leadership – it does not seek to reject or replace these models. Complexity thinking requires the leader to view business within a wider context, embrace different skills and understand that a complex adaptive system can exist in three states: chaotic, stable and in the space which exists between, the edge of chaos or space for novelty/creativity. In this space of bounded instability, the complexity leader learns to dance between chaos and stasis. The complexity leader triggers disruptive patterns of behaviour and thinking in order to stimulate agents' creativity and innovation (Lewin & Regine, 2000).

Borrowing from quantum mechanics, Schrodinger's Cat experiment, is a metaphor for the new complexity leader. Just as the laws of physics no longer apply in a quantum world; the old paradigm business laws no longer apply in a non-linear world wherein the complex behaviour of the system emerges from the interaction of the diversity of individuals or agents and the relationships between these agents within the system itself. There is no leader, no

controlling mechanism. The system responds to external stimuli and adapts its behaviour and learns (Cilliers, 1998).

The Austrian scientist, Erwin Schrodinger, (along with Einstein) refused to accept quantum mechanic's notion that nothing is real and that we cannot predict or say anything about what is happening when we are not observing. The act of observation equates with reality.

To demonstrate the absurdity of the quantum world, Schrodinger's thought experiment placed a live cat in a box that contained radioactive material. Quantum mechanics tells us that the cat exists in an indeterminate state: neither dead nor alive. There is no reality until the box is opened and the cat is observed. This fictitious experiment caused Einstein to utter: "God does not play dice". (Gribbin, 1984. p.3)

In 1982, a scientific team tested Schrodinger's mythical cat concept when they sent two photons or particles of light flying off into opposite directions at the speed of light. The photons were observed and measurements made on one photon had an instantaneous effect on the behaviour of the other photon – suggesting that they are inextricably linked and that their interaction and information exchange disobeys Einstein's theory that nothing can travel faster than the speed of light. (Gribbin, 1984)

In the subatomic world, all we can know is the outcome. We cannot predict what may occur. Electrons are both particles and waves; we can be both participant and observer; it is a world of opposites and paradoxes.

The quantum world consists of individual particles, as does our physical world. Direct extrapolation from the quantum world to the physical can be misleading, but quantum theory provides us with valuable lessons – space, for example, is filled with particles of opposites (ie protons, antiprotons) that can spring into existence at any moment (Youngson, 1998).

The complexity leader is involved in the search for Schrodinger's Cat. The organisation is the box and we cannot predict or know the reality of the contents of the box until we participate and observe. Precise five year strategic plans will not suffice in the world of the unpredictable and must give way to probabilities/scenarios. The complexity leader must articulate purpose, yet accompany this articulation with several probable outcomes. The new leadership is not about having the right answers; it is about asking meaningful questions which help to generate new contexts and co-create new and alternate meanings.

The new leader is both observer and participant – observer and nurturer of the environment in which agents roam; participant in emergent teams and agent interactions.

Complexity thinking involves an appreciation of the subtleties and strengths of networks. As Lewin and Regine correctly state:

*"Leaders in complex adaptive systems lead change. For leaders coming from a command and control tradition, leading change requires an expansion of skills. But it's not just skills....it's a different way of **being** a leader. You can't command or control change – a linear approach doesn't work with something essentially nonlinear. It requires*

*something more organic – rather than **doing to**, it's a **working with** and **for** people. To change how people work begins with changing how you lead...which then sends runners of influence throughout the organization..". (Lewin and Regine, 2000. p263).*

New leadership equates with leading change and influencing the networks of agents that proliferate throughout a corporation. Influencing involves assisting emergent dialogue and emergence of complex networks; assisting the system to self-organise and create temporary boundaries around itself and intersecting system boundaries; assisting conservation of energy, perhaps through generating likely scenarios so that agents do not waste energy pursuing "fixed-in-time" strategies using irrelevant or inappropriate input (ie information, resources).

Before developing the guide for complexity leaders, it would be useful to set out, in the following Table 2.1, the comparisons between the attributes of the modernist leader with those of the new leader. This will serve as summarisation of the issues to this point:

	Modernist paradigm	Postmodern/complexity paradigm
Direction	<p>Planning, measuring, budgeting, eye on bottom line, monitoring, fixed strategizing; CEO is status; single-loop learning (ie conditioning, no change); leadership resides in one person or senior management. Gives feedback based on performance.</p> <p>"I-centred" leadership.</p>	<p>Guiding, mentoring, coaching, assisting, partnering, co-creating, co-evolving, keeping an eye on the horizon, understanding network horizons of agents (eg who knows who, what are the connections between people?), embraces possibility space/whitespace; CEO is a mere title; double-loop learning (ie adapting behaviour to stimuli presented); leadership emerges from the system and shifts around the system. Leadership as attractor. Gives feedback based on performance/execution so system can learn/improve.</p> <p>"We-centred" participative leadership.</p>
Alignment	<p>Directing and controlling; organizing and staffing; creating fixed/determinate boundaries</p>	<p>Creating shared culture/memes/values; helping others grow; reducing boundaries; reducing hierarchy</p>
Relationships	<p>Focusing on objects/products/goods/services;</p> <p>Authority based on position of power; acting as boss; will tell you what you need to know based on your position</p>	<p>Focusing on people and networks; inspiring and motivating others; empathic; servant leadership, facilitator, coaching; authority based on personal power, respect and self-awareness; providing input to the system (ie knowledge, information)</p>

Personal characteristics	Emotional distance; aloof; expertise and competence rests in leader; talking; seeking conformity; insight into organisation; punishes	Emotional intelligence and connections; listening to heart; open mind; listening to others; non-conformity; courage; integrity; insight into self; rewards agents for their reach in the organisation; competence rests in agents/network.
Outcomes	Maintains stability, order, harmony, silences critics or opponents, denies paradoxes	Accepts and creates change, triggers disruptive patterns, accepts and works with paradoxes; accepts diversity, encourages surfacing of tension and critics and negotiates. Capacity to play with metaphor.

Table 2.1 (Source: adapted from Daft, 1999, p39)

Living leadership: a guide for complexity leaders

The guide developed in this section involves two parts:

- (1) a framework of leadership* which shows the levels of leadership fitness; and
- (2) using key complexity concepts, discuss how the complexity leader can understand and work with these concepts.

The first awareness for the complexity leader is the notion of paradox. Complexity leadership is paradoxical leadership in that leaders must be conventional directors of others, yet at the same time not intentionally direct.

* developed by the author. Based loosely on Kelly and Allison, 1999

The new leader negotiates harmony and conflict. Note this is an "*at the same time*" position, rather than a "*both/and*", "*either/or*" position (Griffin, 2002).

The mask of artificial leadership can be dropped the moment the leader acknowledges that the notion of leadership is created and recreated in the complex responsive processes and interactions that are a part of daily life in a network of agents/employees (Stacey, 2001). Leadership is therefore located at the local level through participation and, as the system evolves, complexity leadership emerges at the level of the system itself, not from its individual parts or relationships.

The complexity leader should be aware of the stages of leadership fitness in Table 3.1:

<p>Level 5 Consciously competent autopoiesis</p>	<p>Leader and system influencing future. Adapting to environment and triggering major changes in current industry/environment. Internal and external environments understood, scanned and changing contexts anticipated. Open system. Leader and system reflective, strong self-discipline. Leader assists in process of self-organisation, creating temporary boundaries until new meaning emerges. Preserving/renewing system over time. Creative space is participatively occupied. Leadership "role" shifts around the system. Leader and agents tap into collective knowledge and generate new knowledge. Fitness level evolves through feedback. Agents and leader self-responsible and collectively responsible.</p>
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<p>Level 4 Advancing self-organisation</p>	<p>Leader and system is poised to trigger major change from peaks in fitness landscape. Objective is to reach the nearest higher peak in fitness landscape. Keeping pace with today and tomorrow. Generating scenarios for future states, forecasting trends in agent results. Harnessing power of interlocking clusters and networks. Leader is encouraging self-organisation of shared memes (cultural values) so as agents come and go, new agents become self-similar and change cascades throughout the system via new memes to all cellular parts. Leader develops web of diverse agents; builds fractal teams that share the same attractors and can be formed and reformed quickly.</p>
<p>Level 3 Guided self-organisation</p>	<p>Leader becoming self-aware and understanding that power resides in ability to guide, mentor, coach, assist emergent processes and agents. Leader negotiating around conflict, enabling productive yet unspecified future states. Recognising and leveraging lessons learned. Seeing interlocking patterns across the business web. Fit for current industry</p>
<p>Level 2 Conscious self-organisation</p>	<p>Struggling to keep up in current environment. Leader starting to recognise meta-patterns, tracking performance in environment, recognises notion of fitness landscapes and works with agents to navigate the fitness landscape. Starting to work with and assist emergent patterns</p>

	and behaviours.
Level 1 Unconscious Self-Organisation	Leader and system unable to absorb information/energy required to co-create or co-evolve. Leadership fitness is at level of not being able to view wholeness or see patterns. Emergent behaviour is unrecognized. Self-organisation is viewed as possibly subversive. Closed system fit for obsolescence.

Table 3.1

Leaders and systems at Levels 1 or 2 could suffer the same fate as the dinosaurs – extinction and/or endangerment. Level 3 leaders are surviving in a rapidly changing environment but are only just keeping their heads above the roiling waters. Levels 4 and 5 are the fitness levels that will give a leader and the organisation the innovative capacity to compete successfully on the edge.

Leadership framework for understanding key complexity concepts

By understanding and using some of the key concepts from complexity, the new leader can gain a heightened sense of awareness and intuition that will enable the leader to dance between chaos and stasis. The following is not an exhaustive list but provides complexity leaders with suggestions for applying complexity notions in a business context and gaining a complexity advantage.

Fractals: fractals equate to self-similar patterns or behaviour that “fractures” throughout the system and may be found at the edge of chaos. In the context of the knowledge economy (in which employees apply their ideas rather than raw muscle power), fractals are tacit (invisible) knowledge because they form part of the organisational, genetic memory that allows the system to make sense of itself. (Stacey, 1996).

Complexity leaders can assist agents to tap into the collective knowledge base and generate new knowledge and innovative approaches. This could be achieved, for example, by building diverse teams of agents covering a specific spectrum of competencies; building shared vision and memes so that corporate values and goals are self-similar throughout the system; building fractal teams that share the same attractors; engaging in generating future state scenarios.

The creation of new knowledge, both tacit and explicit, is now recognised as the only way contemporary organisations can survive. As attractors (new knowledge) are generated and the fitness landscape changes, these attractors are less meaningful to the system (old knowledge) and become part of the system's memory. If we accept that knowledge management (the new organisational technique for managing corporate know-how) can facilitate the emergence of attractors, then we can perhaps add to this by saying that fractals (self similarity) can be seen as the **links** between different evolutionary attractors. Complexity leaders can encourage and facilitate this process of knowledge creation (Davenport and Prusak, 1998).

Non-linearity: non-linearity refers to a system when actions can have more than one outcome and very small differences at the start may generate non-proportional outcomes. This sensitivity to initial conditions is known as Lorenz' Butterfly Effect (Capra, 1997).

The complexity leader should pay attention to the butterfly metaphor, particularly at turning points in the business such as the launch of a new product, starting a new team or department.

In the specific context of human networks, we explored earlier the notion of the shadow system – the interactions of agents which fall outside the so-called legitimate structure of a corporation. The shadow network is where employees pursue their own agendas, manipulate and bend the corporate rules and get the job done without the interference of bureaucracy. In the shadows, agents play, create meaning, surface innovative solutions etc.

Where the legitimate structure and its links involve linearity to a large extent, the shadow structure involves non-linearity. The legitimate network may be driven by a set of rules governing people or a strategy that has outputs proportional to the inputs. In contrast, the shadow network does not always follow corporate rules. It has a myriad of diverse purposes with multiple meanings. It is quite clearly non-linear since agent actions and responses may be more or less proportional to the stimulus; unexpected, emergent actions will arise; and emotions, uniformity and diversity are all played out.

The boundaries of the shadow system are not clear-cut. This fuzziness extends to other shadow systems within, or external to a corporation, and agent interactions are characterised by unanticipated outcomes (Ward and Sbarcea, 2002).

The complexity leader works not only within the legitimate structure but also at the edges of the shadow system and must acknowledge and participate in the shadow network – as observer and participant. Bringing the legitimate and shadow structures closer together will result in a fluctuating yet healthier business ecosystem.

Attractors: as a state of behaviour into which a system settles, leadership is quite clearly an attractor since, for the system to aggregate, the leader is a point of being/reason. Attractors are energies and the complexity leader must understand these different energies (ie strange, periodic attractors).

For a system to remain fit and evolve, some form of stability is required. When a system is attracted to a higher peak in the fitness landscape, the system enters a state of chaos through which the leader (as strange attractor) must lead. The new leadership role equates to helping the system enter its various phase transitions and understanding and working with the energies inherent in attractors as the system journeys (Waldrop, 1992).

Leadership holds the system together and different agents emerge who are able to engage with the environment the system is currently located in. The nature of complexity leadership is that even if an agent has been designated "leader", that leader will relinquish leadership should the system be in a state where another agent has stronger skills to lead the system through that state.

Feedback loops: the complexity leader needs to identify and influence feedback loops. For a system to evolve and self-regulate, it must receive input or information about the outcomes of its actions. This information is fed back into the system recursively and can influence strategic decision-making processes and future actions. Both negative and positive feedback loops help the leader to identify gaps or discrepancies between desired outcomes and the actual outcome

Since complex systems will produce unintended consequences, it is essential that the complexity leader analyse and understand the feedback connections in the system. Effective intervention relies on the leader understanding feedback processes. By perceiving the feedback processes at play, the leader may see, for example, that relaxing the limits to growth on the system will in fact limit growth rather than cause growth (Stacey, 2000).

Autopoiesis: an autopoietic system is one that is self-organising. It creates its own boundaries and self-regenerates and self-perpetuates. The complexity leader can assist a business to become consciously autopoietic (as outlined in Table 3.1) by specifically:

- articulating a clear mission so that agents recognise the boundary of the system
- co-developing shared vision and core values/competencies so that cultural, inheritable memes are articulated and can cascade throughout the system resulting in a fractal belief system or culture. By so doing, the essence of the whole is maintained.

- building fractal teams so that as agents depart or resources are depleted, the system can regenerate itself easily by adding new agents and creating new functions (Kelly and Allison, 1999)
- acknowledging punctuated equilibrium – a system may be in stable mode for some time and the leader and agents may need to introduce bold restructuring in order to leap to a new fitness peak (ie evolutionary progress)
- the complexity leader needs to expand the organisation's space of possibilities. Meaningful questions concerning what range of actions are available to the business need to be generated and explored. The fullest range of actions needs to be identified without committing to any particular one.

Conclusion: new leadership

If we accept that complexity leadership is an on-going process of meaning creation, change and influencing which is the result of complex responsive processes of leader/agent interaction at the local and system level, then we recognise that there will be many emergent forms of leadership in a business ecosystem (and indeed throughout history).

If the very essence of the complexity leadership theme is the recognition that the leader is dealing with paradox and difference, then a number of leadership themes are being enacted simultaneously and which we have explored.

Leader/agent participation in terms of co-constructing an unknown future requires agility, flexibility and open-mindedness. Leaders and agents working within an old paradigm structure will no doubt be asked for "proof" of the success and utility of this style of new leadership – the very question itself indicates that it is posed by those operating within a stable equilibrium perspective that still dominates current business thinking.

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