

### Glossary of Terms

- I. *Adaptive*: refers to the fact that living systems constantly adapt to their changing environments. (Adapt means “fit to.”) In organizations people adapt to each other, to customers, the economy, competitors, and many other things. They are able to adapt through learning. Continuous learning is very important in Complexity organizations. (Lawrimore, 2004)
- II. *Appreciative Inquiry (AI)*: The cooperative, coevolutionary search for the best in people, their organizations and communities, and the world around them. It involves systematic discovery of what gives “life” to an organization or community when it is most effective, and most capable in economic, ecological, and human terms. AI assumes that every organization or community has many “untapped and rich accounts of the positive” – what people talk about as past, present, and future capacities – the positive core. AI links the knowledge and energy of this core directly to an organization or community’s change agenda, and changes never thought possible are suddenly democratically mobilized. (Holman, DeVane, Cady, & Associates, 2007, p. 75)
- III. *Balanced Scorecard*: The balanced scorecard is a strategic planning and management system that is used extensively in business and industry, government, and nonprofit organizations worldwide to align business activities to the vision and strategy of the organization, improve internal and external communications, and monitor organization performance against strategic goals. (Balanced Scorecard Insitute, 1998-2000)
- IV. *Complex*: refers to the fact that groups of living things and their behaviors are complicated. (The root word means “twisted together.”) Creating computer models of these living beings and their behaviors is extremely challenging and has really only been possible in the past 10 – 15 years. These models give new insights into how organizations work and how to make them better. (Lawrimore, 2004)
- V. *Complex Adaptive System*: A complex, nonlinear, interactive system that has the ability to adapt to a changing environment. Such systems are characterized by the potential for self-organization in a nonequilibrium environment. A CAS evolves by random mutation, self-organization, the transformation of their internal models of the environment and natural selection. Examples include living organisms, the nervous system, the immune system, the economy, corporations, societies and so on. In a CAS, semi-autonomous agents interact according to certain rules of interaction, evolving to maximize some measure such as fitness. The agents are diverse in both form and capability, and they adapt by changing their rules and, hence, behavior, as they gain experience. Complex adaptive systems evolve historically, meaning their past or history (their experience), is added onto them and affects their future trajectory. Their adaptability can either be

increased or decreased by the rules shaping their interaction. Moreover, unanticipated, emergent structures can play a determining role in the evolution of such systems, which is why such systems show a great deal of unpredictability. However, it is also the case that a CAS has the potential of a great deal of creativity that was not programmed into it from the beginning. Consider an organization such as a hospital, as a CAS shifts how change is enacted. For example, change can be understood as a kind of self-organization resulting from enhanced internal connectivity as well as increased connectivity to the environment, the cultivation of diversity of viewpoint of organizational members, and experimenting with alternative rules and structures. (Zimmerman, Lindberg, & Plsek, 2001, p. 263-64)

- VI. *Complexity*: A description of the complex phenomena demonstrated in systems characterized by nonlinear interactive components, emergent phenomena, continuous and discontinuous change, and unpredictable outcomes. Although there is at no one accepted definition of complexity, the term can be applied across a range of different yet related system behaviors such as chaos, self-organized criticality, complex adaptive systems, neural nets, nonlinear dynamics, far-from-equilibrium conditions and so on. Complexity is usually understood in contrast to simple, linear and equilibrium-based systems. Measures of complexity include algorithmic complexity, fractal dimensionality, Lyapunov exponents, Gell-Mann's effective complexity and Bennett's logical depth. (Zimmerman, Lindberg, & Plsek, 2001, p. 263)
- VII. *Complexity Science*: It is this emergent behavior which complexity science studies. The parts and wholes together are referred to as systems; when they interact and adapt to changes in the environment in which they are located, such systems are referred to as "complex adaptive systems" or CAS...Complexity science aims beyond description to discover what commonalities may lie behind emergent behavior. It is not sufficient to observe that birds often fly in flocks...Complexity science allows us to study underlying rules of interactions and interdependencies with the aim of explaining how it is that complex phenomena emerge from handfuls of simple guiding principles. The aims of complexity science fit well with the demands of the struggling manager – explaining complex situations with a few simple rules would be the magic bullet that many CEOs and mid-level managers cry out for. But, and it is an important but, complexity science is not yet at the point of being able to consistently deliver outputs which match its aims. The risk to managers lies in the attraction of a magic bullet which does not yet exist. (Lissack & Roos, 1999, p. 11)
- VIII. *Emergence*: The idea that wholes can be greater than merely the sum of their parts and that by changing scales it is possible to observe "new, emergent" properties of the whole. These "new" properties are the product of the interactions of the parts. Thus, a person is more than just a torso, head and four limbs; a car is more than just wheels, axles, engine and chassis; and an organization is more than just a collection of people thrown together

in the same room with a few desks and telephones. When the parts interact (the body parts function together, the wheels turn by action of the engine and carry the chasis along with them; or people start communicating and then acting together ), something “greater” emerges. (Lissack & Roos, 1999, p. 10)

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

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

By understanding and manipulating these three conditions, the change agent can support effective self-organization. (Olson & Eoyang, 2001, p. 11)

- X. *Emotional Intelligence:* Refers to the capacity for recognizing our own feelings and those of others, for motivating ourselves, and for managing emotions well in ourselves and in our relationships. It describes abilities distinct from, but complementary to, academic intelligence, the purely cognitive capacities measured by IQ. (Goleman, 2006)

- XI. *Feedback:* Feedback is the transmission and return of information. For example, imagine that you are steering your car into a curve. If you turn too sharply, you receive visual cues and internal sensations that inform you that you are turning too much. You then make adjustments to correct the degree of your turn. The most important feature of feedback is that it provides the catalyst for a change in behavior. A system has feedback within itself. But because all systems are part of larger systems, a system also has feedback between itself and external systems. In some systems, the feedback and adjustment processes happen so quickly that it is relatively easy for an observer to follow. In other systems, it may take a long time before the feedback is returned, so an observer would have trouble identifying the action that prompted the feedback. For example, if you sunbathed a lot in your teens, you may develop skin problems after age 40 – but because so much time passed between the two events, you may not recognize the connection between them. Finally, feedback is not necessarily transmitted and returned through the same system component – or even through the same system. It may travel through several intervening components within the system first, or return from an external system, before finally arriving again at the component where it started. (Anderson & Johnson, 1997, p. 4 – 5)

- XII. *Field Theory*: [Kurt] Lewin believed that for change to take place, the total situation has to be taken into account. If only part of the situation is considered, a misrepresented picture is likely to develop...[from Smith 2001] For Kurt Lewin behavior was determined by totality of an individual's situation. In his field theory, a 'field' is defined as the 'totality of coexisting facts which are conceived of as mutually interdependent' (Lewin 1951: 240). Individuals were seen to behave differently according to the way in which tensions between perceptions of the self and of the environment were worked through. The whole psychological field, or 'lifespace', within which people acted had to be viewed, in order to understand behavior. Within this individuals and groups could be seen in topological terms (using map-like representations). Individuals participate in a series of life spaces (such as the family, work, school and church), and these were constructed under the influence of various force vectors (Lewin 1952). (Neill, 2004, p. 1)
- In Lewin's (1997) own words, "to understand or to predict behavior, the person and his environment have to be considered as *one* constellation of interdependent factors. We call the totality of these factors the life space (LSp) of that individual" (Lewin, 1997).
- XIII. *Graphic Facilitation*: A powerful facilitation tool that uses both words and pictures to record and facilitate meetings. Key ideas and concepts are captured in real time on a large display that promotes "big picture thinking" and stimulates participation, creativity and focus. The visual record encourages teams to clarify differences and define goals. Connections are surfaced and made visible which helps the work group to remain energized and focused. It adds another dimension to traditional facilitation methods. (Braisby)
- XIV. *Lean Enterprise*: A business system for organizing and managing product development, operations, suppliers, and customer relations. Business and other organizations use lean principles, practices, and tools to create precise customer value—goods and services with higher quality and fewer defects—with less human effort, less space, less capital, and less time than the traditional system of mass production. (Lean Enterprise Institute, 1997-2008)
- XV. *People Are Agents*: The living parts (people) of complex systems are called *agents*. An agent is "one who acts, exerts power, and represents the organization as a whole." Agents interact with each other, affect each other, and in so doing are capable of a high degree of creativity and innovation which cannot be precisely predicted. Whether you call your people agents or not, it is important to recognize their power to act as agents and the value of their interacting with each other. In Complexity organizations, taking care of customers and creating innovative solutions are not just the responsibility of specific departments but of all agents. (Lawrimore, 2004)

- XVI. *Reductionism*: An approach to building descriptions of systems out of the descriptions of the subsystems that a system is composed of, and ignoring the relationships between them. (Bar-Yam, 2000)
- XVII. *Self-Organization*: A process in a complex system whereby new emergent structures, patterns and properties arise without being externally imposed on the system. Not controlled by a centralized, hierarchical command-and-control center, self-organization is usually distributed through a system. Self-organization requires a complex, nonlinear system under appropriate conditions, variously described as “far-from-equilibrium,” critical values of control parameters leading to “bifurcation,” or the “edge of chaos.” First studied in systems by Ilya Prigogine and his followers, as well as the Synergetics School founded by Hermann Haken, self-organization is now studied primarily through computer simulations such as cellular automata, Boolean networks and other types of artificial life. Self-organization is now recognized as a crucial way for understanding emergent, collective behavior in a large variety of systems including: the economy, the brain and nervous system, the immune system, ecosystems and the modern large corporation or institution. (Zimmerman, Lindberg, & Plsek, 2001, p. 270)
- XVIII. *Six Sigma*: A methodology that blends together many of the key elements of past quality initiatives while adding its own special approach to business management. Essentially, Six Sigma is about results, enhancing profitability through improved quality and efficiency. Six Sigma emphasizes the reduction of variation, a focus on doing the right things right, combining of customer knowledge with core process improvement efforts, and a subsequent improvement in company sales and revenue growth. The Six Sigma methodology encourages companies to take a customer focus in order to improve their business process. (Summers, 2007, p. 2)
- XIX. *Small Changes Lead to Large Effects*: In a complex system, small changes can lead to larger effects, which in turn lead to ever larger effects. This snowballing effect is one thing that distinguishes living systems from mechanical systems, where small changes only lead to small effects. This is sometimes called the “Butterfly Effect” because a butterfly flapping its wings in India may influence air currents that eventually lead to a windstorm in Chicago. In a Complexity organization, one person may discover something new, other people in the organization may “flock” to this discovery, and in a short time the change has swept through the organization. This is more likely to happen in a Complexity organization where there is a high degree of flexibility and communication, but it can happen in any complex system - often in unpredictable ways. The decisions of a few al Qaida members to seize jet planes and crash them into the World Trade Center had enormous effects on the American economy and ultimately the whole world - far greater than anyone expected. (Lawrimore, 2004)

- XX. *Strategic Planning*: A systematic process through which an organization agrees on – and builds commitment among key stakeholders to – priorities that are essential to its mission and are responsive to the environment. Strategic planning guides the acquisition and allocation of resources to achieve these priorities. (Allison & Kaye, 2005)
- XXI. *System*: A group of two or more parts which interact to function as a whole. (The root word *systema* means “organized whole.”) The parts of a system are interconnected and interdependent. Every system is composed of subsystems and is nested within larger systems. A person is part of a department, which is part of a company, which is part of a community, state, nation, and world. They are all systems. The important thing to understand whenever we talk about systems is that we are emphasizing that everything and everyone are interconnected and the whole has characteristics different from the parts. For example an organization has a “personality” that is more than just a group of people. (Lawrimore, 2004)
- XXII. *Systems Thinking*: A school of thought that focuses on recognizing the interconnections between the parts of a system and synthesizing them into a unified view of the whole. (Anderson & Johnson, 1997, p. 130)
- XXIII. *Toyota Way*: Toyota invented Lean Production in the 1940s and 50s. The company focused on eliminating wasted time and material from every step of the production process (from raw materials to finished goods). The result was a fast and flexible process that gives the customers what they want, when they want it, at the highest quality and most affordable cost. Toyota improved production by: (a) eliminating wasted time and resources, (b) building quality into workplace systems, (c) finding low-cost and yet reliable alternatives to expensive new technology, (d) perfecting business processes, and (e) building a learning culture for continuous improvement. (Business Summaries.com)
- XXIV. *Whole Scale Change*: Evolved from “Real Time Strategic Change” (invented by Dannemiller Tyson Associates) and “Real Time Work Design” (invented by Paul Tolchinsky and Kathie Dannemiller). It consists of a series of small and/or large group interactions that enable the organization to shift paradigms, working together to create and integrate all the needed changes. It applies action learning, using Whole-Scale events as accelerators. Through microcosms – groups representing the range of stakeholders, levels, functions, geography, and ideas in the organization – Whole-Scale processes simultaneously work with the parts and the whole of the system to create and sustain change. Whole-Scale also enables a “critical mass” of the organization to create a new culture *in the moment*. That critical mass then models what the organization can look like, becoming the vehicle for powerful change in the whole system. (Holman, DeVane, Cady, & Associates, 2007, p. 165)
- XXV. *World Café*: The innovative design of the World Café enables groups – often numbering in the hundreds of people – to participate together in evolving rounds of dialogue with three or four others while at the same time remaining part of a single, larger, connected conversation. Small, intimate conversations link and build on each

other as people move between groups, cross-pollinate ideas, and discover new insights into questions or issues that really matter in their life, work, or community. As the network of new connections increases, knowledge-sharing grows. A sense of the whole becomes increasingly strong. The collective wisdom of the group becomes more accessible, and innovative possibilities for action emerge. (Brown & Isaacs, 2005, p. 4)

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