

PRACTICAL APPLICATION OF CHAOS THEORY

By the early 1980s, evidence accumulated that chaos theory was a real phenomenon. One of the first frequently-cited examples is a dripping water faucet. At times, water drops from a leaky faucet exhibit chaotic behaviour (the water does not drip at a constant or orderly rate), eliminating the possibility of accurately predicting the timing of those drops. More recently, the orbit of Pluto was shown to be chaotic. Scientists took advantage of applications using chaos to their benefit; chaos-aware control techniques could be used to stabilize lasers and heart rhythms, among multiple other uses.

Another arena within which chaos theory is useful is that of organizations. Applying chaos theory to organizational behaviour allows theorists to take a step back from the management of day-to-day activities and see how organizations function as unified systems. An organization is a classic example of a nonlinear system (i.e., a system in which minor events have the potential to set off grave consequences or chain reactions, and major changes may have little or no effect on the system whatsoever). In order to exploit the chaotic quality of an organization, one needs to try to see the organizational shape that emerges from a distance. Instead of pinpointing causes in the organization for organizational problems, the company is better served, according to chaos theory, by looking for organizational patterns that lead to certain types of behaviour within the organization.

Organizational expectations for acceptable behaviour, and the degree of freedom with which individuals are allowed to work, shape the way a company's problems and challenges are handled by its members. By allowing people and groups within an organization some autonomy, businesses encourage the organization to organize itself, enacting multiple iterations of its own functioning until the various pieces of the organization can work together most effectively. An organization that encourages this type of management has been termed a *fractal organization*, one that trusts in natural organizational phenomena to order itself.

However, applying chaos theory to organizational practice tends to go against the grain of most formal management patterns. Order can be confused with the more popular notion of

control. Defined by organization charts and job descriptions, traditional management does not generally seek to add disorder to its strategic plan. As Wheatley states, "It is hard to open ourselves up to a world of inherent orderliness." Organizations are focused on structure and design. Charts are drawn to illustrate who is accountable to whom or who plays what role and when. Business experts break down organizations into the smallest of parts. They build models of organizational practice and policy with hope that this atomizing yields better information on how to improve the organization's functioning. However, chaos theory implies that this is unnecessary, even harmful.

Self-organizing systems are those enabled to grow and evolve with free will. As long as each part of the system remains consistent with itself and the system's past; these systems can harness the power of creativity, evolution, and free will—all within the boundaries of the organization's overall vision and culture. In this respect, chaos theory shows the need for effective leadership, a guiding vision, strong values, organizational beliefs, and open communication.

During the 1980s, chaos theory did begin to change decision-making processes in business. A good example is the evolution of high-functioning teams. Members of effective teams frequently recreate the role each member plays, depending on the needs of the team at a given point. Though not always the formally-designated manager, informal leaders emerge in an organization not because they have been given control, but because they have a strong sense of how to address the needs of the group and its members. The most successful leaders understand that it is not the organization or the individual who is most important, but the relationship between the two. And that relationship is in constant change.

One of the most influential business writers of the 1980s and 1990s, Tom Peters (b. 1942), wrote, *Thriving on Chaos: Handbook for a Management Revolution* in 1987. Peters offers a strategy to help corporations deal with the uncertainty of competitive markets through customer responsiveness, fast-paced innovation, empowering personnel, and most importantly, learning to work within an environment of change. In fact, Peters asserts that we live in "a world turned upside down," and survival depends on embracing "revolution." While not explicitly concerned with chaos theory, Peters's focus on letting an organization (and its people) drive itself is quite compatible with the central tenets of chaos theory.

As the global economy and technology continue to change the way business is conducted on a daily basis, evidence of chaos is clearly visible. While businesses could once succeed as "non-adaptive," controlling institutions with permanently-installed hierarchical structures, modern corporations must be able to restructure as markets expand and technology evolves. According to Peters, "To meet the demands of the fast-changing competitive scene, we must simply learn to love change as much as we have hated it in the past."

Organizational theorist Karl Weick (b. 1936) offers a similar theory to Peters's, believing that business strategies should be "just in time...supported by more investment in general knowledge, a large skill repertoire, the ability to do a quick study, trust in intuitions, and sophistication in cutting losses." Though he did not articulate his theories in terms of the explicit ideas offered by quantum physics and chaos theory, his statements support the general idea that the creation and health of an organization (or a system) depends on the interaction of various people and parts within that system. However, as Wheatley states in her book:

Organizations lack this kind of faith, faith that they can accomplish their purposes in various ways and that they do best when they focus on direction and vision, letting transient forms emerge and disappear. We seem fixated on structures...and organizations, or we who create them, survive only because we build crafty and smart—smart enough to defend ourselves from the natural forces of destruction.

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