

ORGANIZATIONS, CHAOS, FRACTALS, AND LEADERS

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The traditional view in science and organizations is that very close is good enough; small variations won't matter; they can be fixed.

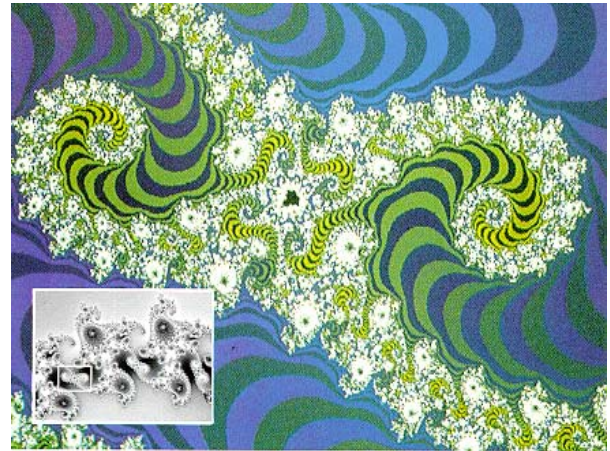
Edward Lorenz and a computer showed that slight variations, when repeated long enough, lead to an inevitable disassociation of previously associated patterns and become chaos.

NEW CHAOS PRINCIPLE: Any physical system that behaves nonperiodically is unpredictable.

Nature is replete with aperiodic systems. Animal migrations that vary just slightly from year to year. Epidemics that appear with similar but not quite exact patterns. Business cycles that produce high then low sales in patterns that are almost the same from decade to decade. Organizational strategic restructurings that occur every few years yet seem to keep the same people in charge. County investment portfolios that produce nearly consistent high yields from year to year.

In science and organizations, as in life, it is well known that a chain of events can have a point of crisis that could magnify small changes. But the establishment of the new chaos principle meant that such points were everywhere. They were pervasive.

Benoit Mandelbrot, a mathematician associated with IBM was interested in the shapes that chaotic patterns found in nature, economic fluctuations, and as a function of repeated computer simulations with very slight variations written into the programs. They all produced chaos which, when repeated sufficiently, paradoxically showed internal patterns. [See the Mandelbrot chaos pattern at the top of the next column.]



Chaotic breaking of continuity into smaller and smaller parts led to patterns within patterns for which Mandelbrot created a new form of geometry which showed that a period of discontinuity nearly always led to more discontinuity, but that the pattern could change to continuous at any time until it became discontinuous again. Mandelbrot needed a name for this paradoxically discontinuous-continuous chaotic pattern and invented the word "fractal" to denote it (from the Latin *fractus*, to break). Fractal patterns are found everywhere in nature (trees, coast lines, circulatory systems, etc.) and in organizations - - unpredictable events that occur in consistent patterns until they don't anymore due to aperiodic influences.

The aperiodic nature of constant change in today's organizations gives nearly every organizational dynamic a fractal quality. Inconsistencies abound until you shift back your perspective to a larger time scale and self-same characteristics form discernible patterns. Today's organizations require fractal leaders who can accommodate and flex with changes while searching new perspectives for patterns that will yield improved performance.