Previously in Part 1

Last installment, we considered Complexity in the first of four parts:

1. ***Illustrative Example***
2. ***Determining the complexity of a problem/situation***
3. ***Assessing the capacity of a person to cope with complexity***
4. ***Developing your potential***

Complexity in essence was defined as "compound intricacy." We illustrated this with a examining the solution of a simple logic puzzle, Sudoku, that asks us to fill in the missing characters, 1-9, in a 9X9 matrix given an initial seeding of some of the cells.

In this installment, we look at some more general aspects of Complexity and how to approach an understanding of its nature.

Determining the Complexity of a problem/situation

Solving Sudoku puzzles involves applying simple rules and sequences of logical deduction. The level of difficulty of a Sudoku puzzle is determined by

- the size of the puzzle (9X9, 16X16, 25X25—a puzzle can be made with any nXn square matrix and a set of n characters) and the number of characters, and,
- the number of initial constraints based on the number of seed characters. The smaller the matrix or the fewer seed characters, the less complex is the Sudoku puzzle.

A 1X1 is the degenerative case and is solved always by 1 character in one cell. A 4X4 is fairly simple and can be solved by most people in their heads or within a few seconds with pencil and paper. The 9X9 requires 15-60 minutes depending on the level of difficulty (my newspaper gives a 1 to 5-star rating) and one's propensity to make mistakes in detailed tasks.

The ability of a person to cope with complexity is the subject of the next installment. We turn now to focus on determination of Complexity for a problem or situation.

The purpose to this would be, of course, to manage, at best, or to cope, at least, with such Complexity. Complexity has become more prevalent in today's world due to uncertainty from the rate of change and the globalization of markets and cultural interactions. I remember the Simple Life on the egg farm where I grew up during the 50's. The life was good in the beginning and we got by very well: Work dawn to dusk. Feed the chickens. Collect the eggs. Take the eggs to the Coop. The worst part was removing the manure. Even that had the benefit of body building for sports. I could hit a baseball like nobody's business, outrun almost all or successfully battle a guy three-six inches taller for the basketball on rebounding. Life was, indeed, Good! The Complexity arrived with government price supports for wheat and feed grains and although we coped with it by growing our own feed, these price supports eventually did us in because the big grain

producers gamed the system by creating tremendous over capacity in the egg producing market. Down went the farm in the early 60's. First we managed. Then, we coped. And finally, we succumbed.

Profiting from Complexity seems to be a complex task. But, there are techniques for managing the Complexity that arises from Uncertainty. The nature of this game, however, always devolves to a situation like the Red Queen from Carroll's ***Through the Looking Glass*** says, "You need to run as fast as you can just to stay in place." The trick is to move on before you reach that point. Nothing like experience to know how.

In a codification of his experience, Paul J. H. Shoemaker of the Wharton School, published an exceedingly helpful strategic planning book in 2002, ***Profiting from Uncertainty, Strategies for Succeeding No Matter What the Future Brings***. It is a great read and contains much greater depth than most of the business books one has to read these days. He treats the compound intricacies of alternative future outcomes in various scenarios, offering methods and heuristics to cope with the risks involved. He provides guidance for assessing the Complexity of a Strategic Situation and then to craft a plan to confront the sea of mercantile travail and change. This is all leavened with many examples from the business news.

In the more formal sphere, any problem or situation can be constrained to varying degrees. Constraints reduce complexity because possibilities are reduced. Computer Scientists, Logicians and Mathematicians have codified complexity though hierarchies of systems. From my reading, the most notable of these are Alan Turing (mechanical intelligence), Alonzo Church (lambda calculus), Stephen Kleene (recursive functions) and Noam Chomsky (phrase structured grammars). These works are quite formal and precise and have all been formally proven equivalent to each other. Their study conditions the mind to see the world as a set of computational problems or formal systems. These classical disciplines distinguish between the decidable and the undecidable. We will speak to these more in the final installment.

However, what is of most interest (and therefore valued in a business sense, per Dr. Shoemaker) in "real" life are the informal and ill-defined problems and situations. Ten years before Professor Shoemaker, M. Mitchell Waldrop pointed in his popular 1992 book, ***Complexity—The Emerging Science at the Edge of Chaos and Order***, complex systems are a place where chaos and order are in balance. The scientists Waldrop chronicles are geneticists, quantum physicists and economists. According to him, these august researchers offer a contrarian approach. In his words, they provide a "rigorous alternative to the kind of linear, reductionist thinking that has dominated science since the time of Newton—and that has now gone about as far as it can in addressing the problems of the modern world." These more modern disciplines distinguish between the certain and the uncertain. They provide the ability to quantify the Complexity of the strategic problems/situations that Shoemaker guides us to carry forward to profit.

In the next Installment, we will treat the other side of coping with Complexity—the Capacity of people who deal with it.

