

Ongoing Discussion “Thought Piece”

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**“Surviving the Fittest:
New Lessons on Competition from Mother Nature”
by Joel A. Barker**

What if I told you that some of our most basic assumptions about competition have been wildly wrong? That the premises we have been operating with, which have been sanctified by references to Darwin, are mostly in error.

Well, it’s beginning to look that way. The results from leading edge scientific research on competition and collaboration in the natural world will dramatically impact the business community as it gets generalized to other complex systems.

For the past seven years I have been studying complex systems theory with a focus on ecology to see what insights it has to offer leaders in the 21st century.

Between 1999 and 2001, several long term ecological research projects progressed to the point of being able to draw some very surprising and counterintuitive information about competition.

What is becoming clear is that the “survival of the fittest” as it is generally understood, is a myth and most of what Mother Nature does doesn’t fit that mold at all!

The new research took the necessary time to look past the standard tooth and claw stuff. The researchers found that competition for limited resources is much more subtle and complex than we had initially thought. Since our marketplace mentality is dominated by the “fittest” paradigm, we must take note of these new findings.

The first piece of research for your consideration took almost 20 years to gather. On an island in the Panama Canal a team of Princeton researchers led by Stephen Hubbell explored a simple but very important question:

When a tree falls in the forest and a gap forms in the canopy allowing sunlight to penetrate to the forest floor, which plants capture that resource of energy?

The axiomatic answer has always been: the fittest. But, it turns out not to be that simple.

Starting in 1982 Hubbell and his colleagues measured more than **300,000 trees** of more than 300 species on a 125 acre (50-hectare) plot on Barro Colorado Island. Then in 1985, 1990, and 1995, they measured them again! During that time, they watched the gaps form in the forest canopy (about 1284 formed between 1985 and 1995) and studied what happened at the forest floor when the sunlight arrived.

Here is what they found: instead of the “fittest” plants, i.e., the most competitive plants, getting the sunlight space, it turned out that another mechanism clearly controlled the winner. Very simply put, the plant that won the space was the plant that was ready, *at that moment*, to access the opportunity.

Readiness to respond was by far the most powerful factor in determining the winner. Let me quote from Dr. David Tilman, a pre-eminent ecologist from the University of Minnesota: “Like a team that fails to appear at a sporting event, a species that is locally absent has forfeited any chance of competitive victory at the site. This can allow inferior competitors (my emphasis) to win by default.”

When you think of it, if the fittest always won, all forests should be completely homogeneous. One species should supplant all others

because it is the most superior competitor. But it doesn't happen that way.

At about the same time I came across this research, the dotcom collapse was just gaining momentum. During a presentation in which I mentioned this research, a Harvard MBA came up to me (he told me he was a Harvard graduate as he introduced himself) and said that obviously the ecological example had no relevance to human beings and the marketplace because the dotcoms had responded with great speed and died.

I thought about that and realized that there was an enormous difference between the dotcom collapse and the ecological GAP example. The difference, simply put, was that all the plants, even though they were mediocre competitors, had a complete set of DNA. They were fully functional organisms. Most of the dotcom companies were just the opposite—short strings of very clever “innovation” DNA with huge gaps of “business” DNA missing. Without that DNA, their ability to be a fully functioning organism was terminally compromised.

So, ecological research backs up the importance of speed to respond as long as you are a functioning entity. You don't have to be the fittest, but you do have to be fit.

The second research example also has to do with fitness. This research was done by computer modeling the interaction of single celled animals, but I see it as relevant at all levels of complexity.

Again, let's set up the experiment. The axiom to be examined is:

Competition for scarce resources will separate the strong from the weak with the strong dominating. And, in the long run only the strong will survive.

That axiom sounds very familiar to anyone in business. It is a business axiom as well.

Two Dutch researchers, ecologist, Jef Huisman, and mathematical biologist, Franz J. Weissing, created a computer model to test the theory. They set up initial conditions between simulated cells with various strengths and weaknesses and then placed those sim-cells into a solution of resources. With two sim-cells and less than three resources, the strong did dominate. But as soon as the system got even a little complex, the strong found themselves in a very different situation.

The researchers found that as soon as there were three resources *in short supply*, that up to nine separate species could **prosper** in very close conditions. And if they upped the number of resources to five, a much larger group of different species could thrive.

Why? What allows less competitive species not to *just get by*, but do well in spite of the presence of a much more effective competitor?

It has to do with the oscillation of resources being consumed. When one species that excels in capturing one resource gains the upper hand, its population grows. That added population eats more of that resource, thus diminishing access to it.

Meanwhile, as that species is focusing on their key resource, another species, which doesn't need as much of that resource, puts its energies into capturing another resource and, for the moment, becomes the dominant species. Thus, as the resources oscillate, every species gets to be "resource dominant" for a short time.

Applying their computer model to the real world, biologists have already measured 20-40 different species of phytoplankton coexisting within a single cubic centimeter of water, which has only sunlight, and a handful of different nutrients.

So, you don't have to be the best to do well. You do have to be able to have one "strongest" skill, but you don't need all strongest skills. And, as the number of resources increases, the number of "co-existors" increases enormously.

Think about the implications of this phenomenon in the marketplace: a marketplace begins very simply with three resources to trade. That means nine competitors can do well. As these competitors interact, someone discovers another resource. The number of competitors increases. And once this cycle gets established, it feeds on itself. Add to that a community made up of thinking human beings who can creatively discover previously unused resources. Each time another resource is added to the mix, no matter how limited, it provides another element to the complex system thus increasing the opportunity for more participants.

This pattern grows richer and richer and it is only limited by the number of different resources available for use. This interaction helps explain why open markets are so successful for so many people. And it also carries a warning of what happens when companies try to reduce competition or access to resources.

For businesses, this gives great hope to those companies who will never be the best in the world, but can be the best in one speciality.

As a result of this emerging body of research, we now must reexamine our competitive paradigm and factor in the new information. It is now clear that “the fittest” not only don’t win all the time, but are only a piece of the more complex system. This information can lead to new strategies for small companies and new insights for the big companies that presently dominate their industries.

What is clear from these two experiments is that we are going to have, over the next decade, a flood of insights on how to better manage complex systems thanks to the ecologists of the world.

And that’s a good thing.

“Algae need not be the fittest to survive,” Science News, Vol. 156, page 340, November 27, 1999

“New Light on Diversity” by John P. Wiley, Jr. Smithsonian Magazine, May 1999, pp 20-24.

Biography

Joel Barker was the first person to popularize the concept of *paradigm shifts* for the corporate world. He discovered that the concept of paradigms, which at that time was sequestered within the scientific discussion, could explain revolutionary change in all areas of human endeavor. By 1985, he had built the case and corporations and nations were seeking his advice. In 1986, he released his first videotape, *Discovering the Future: The Business of Paradigms*, which many of have seen. By 1988, it was the best selling business video in history. In 2001, he updated this film to include contemporary examples and a shortened version. In 1990, he released his second video, *The Power of Vision*. This became his second best seller and has also been translated into more than a dozen languages. His book on paradigms, **Future Edge**, published in 1992, was listed as one of the most influential business books of that year by the prestigious Library Journal.