The Beginning of Natural Competition

Competition existed long before strategy. Competition began with life itself. The first one cell organisms required certain resources for maintenance of life. When those resources were adequate, then each generation became greater in number than the preceding one. If there had been no limitation on required resources, then exponential growth would have led to infinite numbers.

But as life evolved, the single cell life became a food resource for more complex life. With greater complexity, each level became the resource for the next higher level. When two competitors were in perpetual competition, one inevitably displaced the other, unless something prevented it. In the absence of some counterbalancing force, which maintained a stable equilibrium between the two competitors by giving each an advantage in his own territory, only one survived.

In this way a very complex web of competitive interaction developed. It required millions of years. Now there are more than a million distinct species which have been catalogued. Each has a unique advantage in competition for its required resources within its particular niche of the environment. There are believed to be millions more such variations of species as yet unclassified.

Since each of these competitors must be unique, the abundance of variations must match an equal variation in potential factors which define a niche and the varied characteristics in the environment which make that combination effective. The richer the environment, the more severe the competition is and the greater number of competitors. Likewise, the richer the environment, the smaller the differences between competitors.

This is quite consistent with biological research of the recent past. Experimental laboratory ecologists discovered in the 1930s and 1940s that if one puts two similar species of small organisms together in a bottle with food and uniform substrate, only once species can persist.1

The observation that coexisting species in nature do differ ecologically and that species must differ ecologically to coexist in bottles led to the “competitive exclusion principle” developed by Georgii Frantsevitch Gause’s, the Russian biologist: “No two species can coexist who make their living in the same way.”

For millions of years natural competition involved no strategy. It was natural selection, adaptation, and survival of the fittest. Random chance determined the mutations and variations which survived and succeeded to compound their numbers. Those who left relatively fewer offspring became displaced. Those who adapted best displaced the rest. Physical and structural characteristics adapted, but behavior adapted also and became embedded in their instinctual reactions.

The awareness of natural competition as a systematic effect is centuries old. Thomas Malthus quoted Benjamin Franklin’s observation about the crowding out of natural competition. Charles Darwin himself credited Malthus with the insight. Alfred Russel Wallace and Darwin, separated by thousands of miles, both developed simultaneously the concept of natural selection by competition. Darwin emphasized repeatedly the overriding importance of competition. It is awesome in its potential for evolution.

As far as we know, only primates possess imagination and the ability to reason logically. But without these capabilities, behavior and tactics are either intuitive or the result of conditioned reflexes. Strategy is impossible. Strategy depends upon the ability to foresee the future consequences of present initiatives.

1 Gause, 1934; Crombie, 1946; Park, 1948.
The Beginning of Strategic Competition

Strategy in its most elementary form most likely developed when the hunting party was formed by early humans to capture large game which could not have been handled by a single individual. But this was hardly true strategy. The quarry itself could have no counter strategy, only its instinctive behavior. True strategy was probably first practiced by one tribe attempting to take over the hunting grounds of another tribe.

For strategy to be possible, it is necessary to be able to imagine and evaluate the possible consequences of alternate courses of action. But imagination and reasoning power are not sufficient. There also must be knowledge of competition and the characteristic higher order effects of alternative actions. That knowledge must reach a critical mass before it becomes really significant. Until enough relationships have been integrated to see the whole pattern, knowledge is no more than the individual pieces of a jigsaw puzzle.

The basic requirements for strategy development are:

• a critical mass of knowledge;
• an ability to integrate all of this knowledge and examine it as an interactive dynamic system;
• the skill at system analysis sufficient to understand sensitivity, time lags, immediate and future possibilities and consequences;
• the imagination and logic to choose between specific alternatives;
• resource control beyond immediate needs; and
• the will to forego current benefits in order to invest in the future potential.

Simple as these requirements may seem, they are absent in natural competition.

Strategic competition requires an ability to understand the dynamics of the complex web of natural competition. The value of strategy in competition comes from developing the potential to intervene in a complex system with only a limited input and thereby produce a predictable and desired change in the system’s equilibrium.

Strategy, as a concept, probably emerged in connection with military operations. All of the elements were present that made strategy valuable:

• finite resources;
• uncertainty about an adversary’s capability and intentions;
• irreversible commitment of resources;
• necessity of coordinating action over time and distance;
• uncertainty about control of the initiative; and
• the critical nature of the adversaries’ mutual perceptions of each other.

A General Theory of Competition

There has always been conflict and competition for scarce resources. Strategy has been practiced whenever an advantage was gained by planning the sequence and timing of the deployment of resources while simultaneously taking into account the probable capabilities and behavior of competition. But the insight about this experience has rarely been integrated conceptually as a competitive system.

Many aspects of competition were explored in great depth but rarely as a dynamic system in equilibrium. The natural field of study which should have been expected to generate such insight was economics. For whatever reason, philosophical constraints on assumptions and their implications were biased, and economics earned the name of the “dismal science.” It remained for a most unlikely discipline, biology, to develop the foundation of a general theory of competition.

Biological study of competition has a long history. But that history was punctuated with a flash of brilliant insight in 1859 by Darwin and Wallace, and then followed by more than three-quarters of a century of data gathering, and apparently little progress, until all of this knowledge began to come together in the third quarter of the twentieth century.

When Darwin delivered his paper, *On the Origin of Species*, to the Royal Academy of Science in London in 1859, it was a perspective from a mountain peak. It would be a long time before the outlines would be examined in detail.
But some of his remarks can readily be translated from biological competition to business competition:

“Some make the deep-seated error of considering the physical conditions of a country as the most important for its inhabitants; whereas it cannot, I think, be disputed that the nature of the other inhabitants, with which each has to compete is generally a far more important element of success.

When we reach the arctic regions, or snow-capped summits, or absolute deserts, the struggle for life is almost exclusively with the elements. When we travel southward and see a species decreasing in numbers, we may feel sure that the cause lies quite as much in other species being favored, as in this one being hurt.

As species of the same genus have usually, though by no means invariably, some similarities in habits and constitution, and always in structure, the struggle will generally be more severe between species of the same genus, when they come into competition with each other, than between species of distinct genera.”

The biologists began to focus on relationships between species in the mid-twentieth century. There are millions of species. They are all unique in their particular niche. This very fact raises the question about the nature of the forces that keep them in equilibrium with each other. Inevitably there is perpetual competition because many species use the same resources. In addition many of the resources for one specimen are other species below them in the ecological chain.

Gradually a whole series of patterns of behavior and characteristic relationships emerged from this intensive research. The analogies to business competition are striking. In the absence of strategy, it is biological competition. As Marshall and Hirshleifer pointed out, economics is only a subset of the sociobiology of one species of the primates. However, the ability to use strategy is the ability to manage the natural competitive system by calculated intervention in order to produce predictable shifts in competitive equilibrium. For that to be possible, you must first understand the characteristics of natural competition.

Natural competition in the strict sense, as it is defined by Darwinian natural selection and evolution, contains no element of strategy. It is pure expediency; almost mindless at some stages. Instinctive needs that are urgent serve as the motivation. Day to day survival and cyclical procreation are the ultimate objectives.

This kind of competition by natural selection is glacially slow. It is trial and error. More mistakes than improvements will prove to be fatal. Over time the more successful patterns must be immortalized and multiplied by the genes, while the mistakes must be diminished in future generations by the same process. It must be a slow process to succeed at all.

Natural competition can and does evolve exquisitely complex and effective forms eventually. Mankind itself is such an end result. But unmanaged change takes many thousands of generations. Sometimes, perhaps often, change is too slow to cope with the combination of a changing environment and the adaptation of competitors.

**Time Compression by Strategy**

By contrast, strategic competition is revolutionary, not just evolutionary. It is capable of extreme time compression. However, to accomplish this revolution, the preparation must be conservative, careful, precise and all inconclusive. The environment itself must be well understood. The competitors who are critical or even important to the change must be equally well identified and understood. Then uncertainties in the environment must be carefully assessed and evaluated. The systematic interaction of competitors with each other and the environment must be modeled and tested for sensitivity. This meticulous staff work must be continued until cause and effect become sufficiently predictable to justify the massive commitment of nonrecoverable resources.

The wild expediency of natural competition leads to glacial evolution. The meticulous conservatism of strategic competition leads to time compression and revolutionary change because strategy is the management of natural competition.

The biological model of natural competition provides illustrations of relationships which are of importance in business competition:
• Every species (business) must be uniquely superior to all others in its chosen combination of characteristics which define its competitive niche or segment.
• The boundaries of a competitive niche are determined by the points where competitors are equivalent.
• At any given boundary line, there will always be a specific competitor who determines that boundary.
  The number of boundary competitors is determined by the number of possible tradeoffs between behavioral characteristics and capabilities which will provide a differential advantage over other competitors in that environment.
  There are a number of corollaries:
  • The more variable the environment, the more combinations that may become critical.
  • The more distinctly different resources needed, the more possible critical combinations that exist.
  • If any one factor is overwhelmingly important, only one competitor will survive.

If the biological pattern of natural competition is useful as a model, then the reality of the competitive system is quite different from traditional microeconomic models.
• Every competitor, whatever the role in the competitive system, requires certain resources to enable it to persist.
• In the absence of some constraint on those resources, every competitor would tend to grow to infinity.
• In almost every case the limit on growth, or size, is set by the ability of some competitor to preempt a significant part of the supply.
• No two competitors can coexist who make their living in the same way. Their relationship is unstable. One will displace the other. This is Gause’s Principle of Mutual Exclusion.
• Except for the most elementary forms of life, the required resources are other forms of life or activity. This establishes a form of vertical equilibrium. The higher levels prey on the lower levels but cannot live without them. Excessive success is self-defeating.
• The horizontal competition between organisms or organizations combined with the vertical dependency on an ecological chain constitutes a community or web of relationships which is in dynamic equilibrium, but in which competition in all dimensions is perpetual.
• A stable relationship which permits both competitors to coexist requires each competitor to have a combination of characteristics in some segment or sector of the environment which permits it to be uniquely superior in that “competitive segment.”
• The source of virtually all resources is elementary natural material. The conversion of these to the form of end use must necessarily be an ecological chain in which each link is the resource for the next higher level which is dependent on the continuation of all the lower level links.

Some analogies between sociobiology and business lead to testable and reasonable hypotheses:
• Pure chance provides an initial advantage to the first competitor to enter or define a competitive segment. The initial competitor becomes a part of the environment to be coped with by the next competitor who chooses to enter that specific arena.
• Definition of a new competitive segment requires that the differences between the specific competitors involved be sufficient to provide a distinct advantage to one of the competitors compared to all others in the competitive niche which is erected.
• If competitors are alike and equally capable, they cannot coexist. One will displace the other.
• Competitors who have distinctly different capabilities cannot coexist in the same competitive segment, but they can and will be in perpetual competition along the boundary lines where their respective competitive segments come into contact (the line of zero advantage).
• If there are few competitors and the market is thin, then the generalist has the advantage. The generalist can obtain a small amount of resources from multiple sources,
but the thin market will support few specialists on an adequate scale to be effective competition for the generalist.

- Conversely, rich markets tend to eliminate generalists since the market can be subdivided into competitive segments each of which can be dominated by specialists of significant scale and scope.
- The ability to grow rapidly when conditions are favorable, and to survive long periods of adversity when conditions are unfavorable, can be a critical combination that offsets superiority in many other respects if the environment is cyclical.
- Since size or scale often provides a significant advantage and size or scale is incompatible with many other characteristics, than an orderly distinction from small to large size is predictable when there is a diversity of factors that are important in a market or environment.
- Since distance and logistics are often critical factors, then both scale and total market size are factors that determine the number, size, distribution and competitive segment boundaries where these factors are important.
- Since the variety of characteristics among competitors is matched by an equal or greater variety in desired or required resources, then every significant difference in customer preferences provides the possibility of subdivision into multiple competitive segments. This is dependent upon the capability to serve both segments simultaneously being incompatible with optimization of both.

The characteristic fundamental resource segments for business are sources of:

- money, either in capital or in ongoing revenue;
- suitable skills, abilities and individuals on an ongoing basis;
- materials, supplies, energy, components not contained within the organization; and
- knowledge and communication capability with respect to all external resources and factors affecting their availability.

- Since multiple resources are always required, there will always be multiple competitors each of which has characteristics that cause it to be the constraint on that specific resource availability.
- Each competitor for each resource will require a different combination of capabilities to be in stable equilibrium with competition.
- Adaptation to meet a specific competitor will often reduce the capability to offset another competitor.
- Any change in the environment will require adaptation of all competitors either to the environment or to each other or both. The equilibrium points between competitors will be shifted for all members of the community web of relationships. This is the logic which describes the competitive system's major constraints. The complexity should be obvious, since it is inherent in millions of unique competitors in a moving but stable dynamic equilibrium.

Then for any specific individual competitor to use strategy, that competitor must be able to visualize the system's behavior and his own relationship to it.

The fundamental requirements for strategy development are:

- a critical mass of knowledge;
- the ability to relate this knowledge in the form of an interactive system;
- the capability of system analysis adequate to determine the probabilities of cause and effect for inputs that result in delayed higher order effects;
- the orderly analysis of alternatives and tradeoffs to determine the optimum sequence and timing of reallocation of available resources; and
- an adequate excess of resources beyond current needs to permit reallocation and the capability of tolerating deferral of benefits in order to compound them.

In business these basics must be converted into an analytical process which permits development of a specific strategy. There are a number of steps:

- First, self-examination to determine what is needed to achieve the organization's purposes and implicit goals. This will determine the combination of resources which will be required on a continuing basis.
- Second, determination of which competitors are the obstacles to those specific resources.
• Third, determination of the differences between you and each of those specific competitors which make each of you superior within your own competitive segments.
• Fourth, determination of which combinations of what factors produce those differences in capability.
• Fifth, mapping of the boundaries of “zero advantage” which determine the individual competitive segments.
• Sixth, mapping of the competitive characteristic resources, behavior patterns and alternatives.

At this point the strategy development process becomes highly analytical in an effort to assess the available alternative payoffs, risks and odds. Because the possible combinations are nearly infinite, however, the final choice, like many business decisions, is essentially an intuitive one.

In spite of the enormous effort and attention devoted to this process, procedure, and conceptual framework over the past 20 years, it is still very much in an early stage of development. The task is even more complex than it appears to be.

Almost every corporate organization is composed of multiple businesses. This requires multiple but compatible strategies. The strategies must be compatible because for a given company all the business units draw upon a common base of resources. The different businesses may share certain capabilities in a synergistic fashion or in an incompatible or preemptive fashion. The company as a whole may have purposes and goals which override or are incompatible with those of the units.

The defender of a competitive segment normally has a significant advantage if alert and entrenched. The result of this is usually a “cold war” stable equilibrium between most competitors. This kind of equilibrium is conditionally unstable, i.e. stable unless disturbed beyond a certain point. Skirmishing and testing of limits occurs continually on the boundary line.

Such a cold war stability depends on the acceptance by both parties that the odds of winning a hot war are insufficient to offset the inevitable losses and destruction of a “negative sum” payoff from such an escalation.

A company with multiple businesses has a multiple of the total resources available to a single business. However, it loses that advantage if the strategies of the individual businesses are not coordinated to preserve adequate uncommitted reserves if any individual business strategy contemplates escalation.

**Strategy and the Future**

Strategy development is still embryonic. But the rate of development of the conceptual base is very rapid and holds forth the promise of precision, elegance and power within a reasonable time period.

It seems almost certain that exponential growth in insight with respect to business competitive strategy will result in time compression for change. Those companies who are not able to learn, adapt and apply these emerging insights at an accelerated rate are subject to Darwinian natural selection. In this context, the race will be won by the swift.