An Ecological Approach to Organizational Strategy

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ABSTRACT

Many global business organizations today use strategy as one of their preferred means of coping with the risk and uncertainty associated with an inability to accurately predict the future. Currently, the most popular metaphors for framing organizational strategies are rooted in war or sports. Use of these particular metaphors to guide leaders' thinking processes can bias strategy into unproductive, win-lose, us or them, competitively-oriented categories. The field of biology suggests a different metaphor that may better suit current environmental realities. This paper proposes a set of ecology-based principles and tools that organizations can use to gain competitive advantage in the marketplace.

INTRODUCTION

One of the things that keep many Chief Executive Officers (CEOs) up at night is thinking about how to best secure the future of their organizations in the light of increasingly uncertain conditions. Frustrated CEOs' struggle with such insomnia-provoking questions as: "What do I tell my board of directors about how we plan to insure our continuing success in the light of intensified social and technical change in our industry?" "How are we going to cope with a growing list of organizations internationally that want what we have and are willing to come after us to get it?" "How should we deal with all the green environmental challenges facing us?" And, "what realistic options are available to keep us ahead of our aggressive competitors around the world?"

Characteristically, in Western nations, the strategic responses to these questions would be rooted in the metaphors of war or sports. Such metaphors tend to channel strategies into restrictive "either-or", "win-lose", "friend-or-foe", "kill-or-be-killed" types of alternatives. The descriptive language used by many strategic planners, reinforced by what is taught in a number of business schools, often reflects the planners' preferred organizing metaphor. For example, strategic moves are couched in such terms as "blitz", "take down", "end-around", "full-court press", and "endgame response."

These combative, primarily masculine-oriented, metaphors appear to be heavily anchored in mechanistic, industrial age, single cause-and-effect thinking. The strategic options that they provide to CEOs are often limited, partial and easily sidetracked by unforeseen events. These options may also fail to consider adequately the possible responses of influential stakeholder groups that will be affected by the selected strategy. Additionally, there is often a single strategic choice to implement that is based on a unitary, forced consensus and predictable view of the future. This perspective is usually based on the idea that the future can be seen primarily as an inductive extension of the past.

Attempts to redress some of the perceived inadequacies of traditional strategic planning have included more projective information-intense strategic planning approaches. These newer approaches attempt to integrate logical, left-brain oriented thinking with the more intuitive, right-brain oriented, thinking processes. One such example is scenario planning [1]. Scenario planning attempts to create multiple alternative views of the future based on a set of plausible assumptions and their associated probabilities about what could happen. A small number of the key driving assumptions are isolated and used to generate a limited group of written stories or scenarios. Scenarios are crafted such that the decision-makers' current perspectives are artfully called into question. The scenario planning process encourages organizational decision makers to reflect upon and anticipate the consequences of possible future disruptive events. The intent is that by using scenario information wisely in the present, leaders may be able to influence and shape the future and be better prepared to handle currently unforeseen eventualities.

The field of evolutionary biology holds promise to provide a significantly more holistic and ecological perspective for strategy formulation. Author and CEO John Clippinger suggests that as organizations become ever more interconnected, volatile, and complex the more traditional approaches to strategy no longer seem to work [2]. Clippinger calls for a different approach that can take advantage of the new science of complex adaptive systems based on biological constructs. Recently, futurists Christopher Meyer and Stan Davis have speculated about what they believe to be the coming convergence of information, biology, and business [3]. The work of environmentalist Bill Shireman and corporate CEO Tachi Kiuchi has also begun to sketch the outline of a powerful new approach to business that moves beyond the old machine age model [4]. Collectively, the efforts of all these authors suggest that

Darwinian rules of evolution may guide the process of change in the economy as well as in biology.

Biology as a scientific discipline is based upon a view of living, as opposed to nonliving, entities that are organized into ecological systems. Additionally, biology has the demonstrable advantage of millions of years of trial and error experience focused into a process of natural selection. Selection acts to refine and reinforce what actually works in practice and to adapt or discard what doesn't. Living systems have internal dynamics and they also interact outside their boundaries with other living systems. In nature's scheme, each individual system seems to be a nested element in a larger and even more complex system and, at the same time, subsumes simpler component systems. At each increasingly higher level of organization new characteristics emerge that are not easily predicted from prior levels. The exchange of information and materials among living systems is two-way. The ability to obtain nutrients and other energy resources from the environment also tends to counteract the second law of thermodynamics related to entropy. Entropy is the inherent tendency of the quality of matter and energy, if left unattended, to move toward decay and disorder. The overriding biological imperative is to adapt to changing circumstances or risk an extinction of a species.

STRATEGY FROM BIOLOGY

Two new disciplines offer particular promise in better relating the fields of biology and business. Biomimetics and Biological Economics. Biomimicry is a growing field based on the conscious application of nature's lessons to human problems [5]. It attempts to learn from and copy natural processes and designs and apply them to serving individual and organizational needs. Organizational strategy can benefit from identifying and mimicking those change-oriented rhythms and patterns in nature that have been refined in the crucible of continuous selective pressure and apply them to business settings.

Biological Economics is concerned with the connections between people, their money and their natural environments [6]. This discipline pays particular attention to biology as it relates to developing monetary values for nature. Called the father of ecological economics, economist Georgescu-Reogen attempted to reformulate traditional

economics as bioeconomics [7]. His work on consumer choice theory presaged current research into the interplay of the natural environment and economic theory. Growing interest in the bioeconomic field has further resulted in the publication of its own specialty professional publication, the Journal of Bioeconomics.

The following strategic principles, based on the successful evolution of living or extant species, are suggested as a beginning application of biology to business strategy. They are derived from both biomimcry and bioeconomics.

1. Ecology matters. In late April of 2008 the search engine Google recorded over 7, 530,000 references to the search terms "ecology of business." Clearly there is a growing interest in how to relate the insights and learning from the field of biology to business. In the book *Pulse*, one of the founders of the field of artificial life, Christopher Langton, noted that "a strategy doesn't have intrinsic value; it has value only in the context of an ecology of other strategies." [8] Business organizations operate within ecological habitats, bounded environments or market niches and are driven by economic needs. Ecological habitats are more than industries. Habitats are populated by a variety of interdependent organizations and institutions. Some of the institutional relationships are competitive, some are cooperative, some are hybrids and some are neutral or indifferent to each other. The organizations are all growing or decaying at different rates. A mature organizational ecology is relatively self-sustaining. In such a mature ecology the outputs of one organization, including its waste products, may be used as inputs for another.

   Business Example: The government of China's recent decision to create a complete major new city designed and built from the ground up to reflect ecological principles.

   Strategic Implication: Understanding the organization's overall context and history is as important to strategy as knowing your competitors.

   Strategic Question: Can you construct a visual map of your organization's current ecological habitat?

2. Recognize that your strengths have limits. An organization cannot progressively employ its' strategy to occupy a market niche and use up all the available resources. Such a strategy becomes ultimately self-defeating. Niche carrying capacity is limited, so some sharing of resources must occur. An additional ecological consideration is that if two species are exactly the same in their ecological requirements then one will out compete the other and threaten its survival. As carrying capacity is reached organizational populations become denser and more diverse and growth slows. Nature can be severe and the less fit individuals will die when carrying capacity is exceeded. Therefore, exceeding or overshooting a natural boundary puts the whole system at risk. This is true whether we are talking about bird species or grocery stores operating in the same geographic area.

   Business Example: Japanese heavy equipment manufacturer Komatsu embarked on a deliberately ambitious strategy to surpass and "encircle" the market leader, Caterpillar. The consequence of Komatsu's sustained but ill-fated attempt to dominate the construction equipment market severely strained the resource capacities of both companies and significantly impacted their profitability.

   Strategic Implication: Overly expansive organizations can act to destroy an entire population of other organizations.

   Strategic Question: What is your estimate of the per capita amount of consumption of your product or service that your chosen market niche can actually support?

3. Effective strategies develop in a variety of ways. Until recently many biologists believed that markedly uneven or "punctuated" change is what primarily occurs in nature. The typical pattern of growth in natural systems was believed to be one that alternates slow, gradual change interspersed with short-duration, high intensity, and large scale change. Recently, an article in the respected journal *Science* suggested that, on

average, only 22% of change is punctuated and that it occurs much more slowly over time [9]. Evolutionarily-successful organisms incorporate aspects of their own genetic potential with their developmental life stage as a means to adapt to the demands of a particular environment. This adaption may occur relatively quickly or take an extended period of time.

Business Example: Mc Donald's fast food business changed their limited standardized menu approach to meal offerings to accommodate the cultural food preferences of their overseas customers.

Strategic Implication: It may be necessary to deliberately introduce an innovative idea or mutation from outside the system in order to trigger an organization's adaptive response to a changing environment.

Strategic Question: What new idea, if introduced, would significantly alter your strategic perspective on your business?

4. Environmental influence is always reciprocal. Both the organization and its environment act to influence each other in an ongoing process of coevolution. Each entity acts so as to alter conditions for the other. What's different between the two influence situations is the intensity, duration, location and tempo of the change activity. The consequence of the organization-environment interaction can be growth, stagnation or even death. Ecologists have identified two kinds of natural growth strategies of organisms, r and k. The r, or pioneer, strategy is to grow fast, produce lots of offspring, and die at a young age. The k, or coexistence strategy, involves becoming specialized to fit a particular ecological niche, conserve resources, produce few offspring, grow slowly and stay alive for the long haul.

Business Example: The uneasy relationship between internet service providers and cable companies. The actions the internet (r organisms) and cable (k organisms) companies both influence each other and act as part of the overall consumer communications landscape.

Strategic Implication: Strategic change can be considered as a process of mutual organization-environment influence; something like being in a ship channel with traffic in both directions. The more conservative or k strategies begin to work after the r strategies begin to fail.

Strategic Question: What currently unanalyzed r or k actions of your organization are shaping your environment in beneficial or harmful ways?

5. Pay attention to what happens at the boundaries. Organizations will act differently in different circumstances depending on the incentives, penalties and rules operating in their habitat. The edges of the habitat tend to be more dynamic and flexible than the core. Disturbed edges also appear to be susceptible to becoming invaded by fast growing invasive species that may crowd out the incumbents. It is often at the edges that different ecological systems intermix, struggle for survival and experiment with creating new, more flexible and dynamic forms and processes. For example, the highly invasive plant species kudzu when introduced into local grasslands quickly grows and threatens to drive out and engulf all of the local plant varieties.

Business Example: The introduction of a new Wal-Mart store, situated outside of major metropolitan areas, drives small, local area department and variety stores out of business.

Strategic Implication: It is important to set up and operate an information collection system to identify, track, and assess what is happening on the fringes of your organization.

Strategic Question: How can you best use your people who are in boundary-spanning roles as sources of strategically relevant information about changes in the environment?

6. Effective strategies incorporate symbiosis. In nature, besides the obvious wariness and tension that exists between predator and prey, apparent contradictions also occur. Ecological symbiosis happens when there

is a close interconnected relationship between two or more species. The relationship can be one where both species mutually benefit, neither species benefits or are unaffected, or where one species benefits while the other is harmed or is unaffected. An example of biological mutualism is in the mutually protective relationship between the clownfish and the sea anemone. The stinging tentacles of the sea anemone offer a protective haven for the clownfish against its predators and the aggressive clownfish protects the sea anemone from larger predatory fish.

Business Example: Stores within stores. Home Depot provides space for a local bank within its big box home building and equipment stores. The bank obtains increased traffic from the customers visiting Home Depot and Home Depot benefits by offering increased convenience to its shoppers.

Strategic Implication: Recognizing the possibilities for symbiosis usually leaves an organization better positioned for success.

Strategic Question: What opportunities for strategic symbiosis are you currently missing out on?

NATURE AS A MODEL FOR ORGANIZATIONAL RENEWAL

The thoughtful application of biological concepts offers considerable promise to the business strategist. For example, by using biological systems as a reference point for thinking about organizational growth and decline, business strategies can be thought of as having a life cycle of their own. That is, strategies typically have origins, shakeout, refinement, productivity, decline, and an end-of-effectiveness stage. Unanticipated events may also result in a regression of phases or in a direct movement toward demise. Viewed in retrospect, each of the linked phases that characterize strategy formulation and execution can be shown to have a time span and a set of benefits, costs, and risks associated with it.

Additionally, considerable literature already exists on viewing organizations as having a set of life stages from inception to termination [10]. A typical lifecycle model might have six stages: creation, launch, growth, maturity, renewal, and termination. The stages correspond roughly to the human cycle of birth, growth, maturity, decline and death. Each stage offers a particular set of challenges and opportunities.

Arguably, your industry is currently in some phase of its own lifecycle and so is your organization. Successful organizations are in a lifecycle stage that is well-matched to the life stage of their surrounding habitats. The lifecycle you are now in or moving toward also colors and predisposes the strategic options that you might see. Therefore, different cycle stages offer organizations different kinds of options and choices. For example, the renewal stage challenges the organization to oppose continuing pressures for entropy or decline, find new possibilities for growth, and to re-invent or reposition itself for future success.

RENEWAL POSSIBILITIES MAP

To assist the strategist in thinking about organizational renewal, two tools modeled from biology are offered as potential aids. The RENEWAL POSSIBILITIES MAP (Figure 1) provides a visual depiction of an organization's ecology. The map also helps us to organize our thoughts, to group like things with like, and to pick out key similarities and differences. Additionally, the map characterizes the organization's habitat by showing the potential interconnections between competitors, suppliers, partners, customers, funders, replacers, and distributors. The organization's current products, services or programs are placed in the center of the map and the key environmental stakeholders are arrayed in a circle around it.

Competitors are those organizations who compete for the same set of physical, monetary, human, informational resources or customers. Suppliers are those organizations that provide the inputs needed to support the organization's production or service processes. Partners are those organizations that have a formal or informal relationship in some aspect of the business. Customers are those organizations or individuals that use or purchase

products or services. Funders are organizations that provide the economic means necessary to operate or sustaining the business. Replacers are those organizations which could, if they chose to, use their resources to supplant the organization in its current markets; or, have access to a technology that could radically disrupt, obsolete or replace the existing core technology. Distributors are intermediary organizations who obtain products or services and channel them to the ultimate user or customer.

Additionally, each of the elements within the organization's habitat can be seen at different levels of complexity ranging from the local to the international. The map also provides the capability of displaying the representative current conditions for each stakeholder element as well as to show possible future conditions. Looking at all the denizens of an organization's habitat together at one time provides the strategist with a combined picture of the ecological forces at work on the institution.

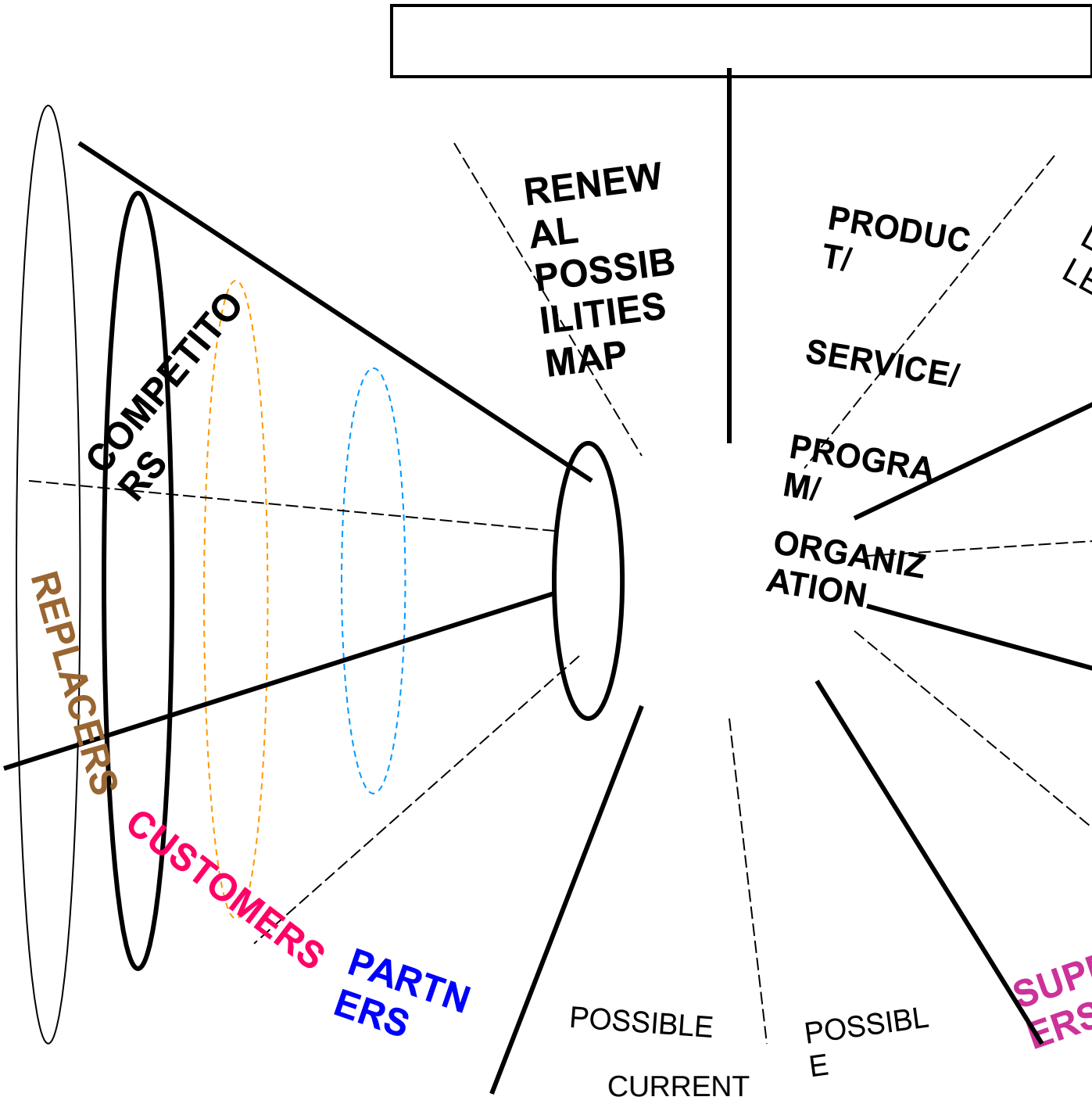
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Figure 1

RENEWAL STRATEGIES DIAGRAM

The Renewal Strategies Diagram (Figure 2) shows the revitalization possibilities available to an organization in the renewal stage of its life cycle. The diagram visually displays options that are potentially available for re-invigorating the organization. The diagram also depicts possible linkages with major categories of stakeholders, or those groups with a vested interest in the organization's success, that are located within their shared habitat. Each of the new stakeholder linkages represents the source of a potential renewal strategy.

In interpreting the diagram, the solid black oval represents the existing boundary of an organization such as a company, not-for-profit unit, or a university The dashed line on the periphery of the diagram represents the habitat boundary. The area inside of this dashed line represents the organization's current markets. The seven single-word labels found outside of this line show the organization's various stakeholder groups. The seven double-ended arrows represent a set of potential renewal options for the organization.

Altering the size of the smaller dashed oval implies changing the organization's definition of itself. Thus, redefinition of an organization's mission or purpose represents one possible strategy for renewal. This strategy is a Strategic Basis Redefinition and involves negotiating a change in the organization's current purposes or altering its mission. The redefinition forces a rethinking and reprioritization of the organization's interactions with its constellation of stakeholders. Moving the organization oval completely outside of the current habitat boundary is a radical strategy or Market Redefinition that involves finding and competing in a completely different ecological niche. More limited strategies called Spinoffs involve the organization's current products or services. This could involve setting up a part of the current organization as a separate entity either within the current habitat or outside of it.

The strategy represented by the Preventative Consolidation arrow at the top of the diagram requires changing the relationship with current competitors. This might involve acquiring one or more of them or offering to be acquired by them. The Fraternal Consolidation strategy involves changing the organization's relationship with its partners. Partners might include other organizations from outside the industry that provide technological, logistics, or market assistance. Partners may also include internal groups such as employees or contract workers. Strategic options here might include becoming part of a virtual organization, establishing a formal joint-partnership agreement to share expertise and risks, the creation of a joint venture or creating an ESOP or Employee Stock Ownership Program.

The ecological metaphor of a river is employed to understand the next two strategies. The movement of goods from their beginnings as raw materials toward their final purchase as finished goods can be considered to be analogous to the flow of water in a stream from its origin at the headwater to the completion of its journey to the sea. The Upstream Consolidation arrow shows a strategy that would alter how the organization works with current suppliers. Obtaining a controlling interest in a key supplier, merging with it, or being purchased by a supplier are related strategic choices. Downstream Consolidation strategically changes the relationship of the organization with its customers. This change may involve taking over a customer or, perhaps, being taken over by a customer.

The Preemptive Consolidation strategy attempts to disrupt the possible inroads on the organization's markets by organizations with products or services that could act to replace or be substitutes for its current products or services. Some of the strategic options include: early investment in new firms working on products or services that might replace the organization's current offerings, using internal research and development efforts to obsolete its own products, or joining with a potential replacer to develop cooperatively a disruptive technology.

Financial Consolidation changes the relationship with sources of the organization's funding organizations. This might involve renegotiating the organization's mix of its primary sources of funds. The financial structure of the organization can be reordered to emphasize different monetary sources such as loans, short term debt, or equities. The strategy of Channel Consolidation focuses on the organization's relationship with its intermediaries or distributors. Distributors can be absorbed into the organization, the organization can choose to distribute its products

or services directly to the end users bypassing distributors, or it may offer to be acquired by a distributor.

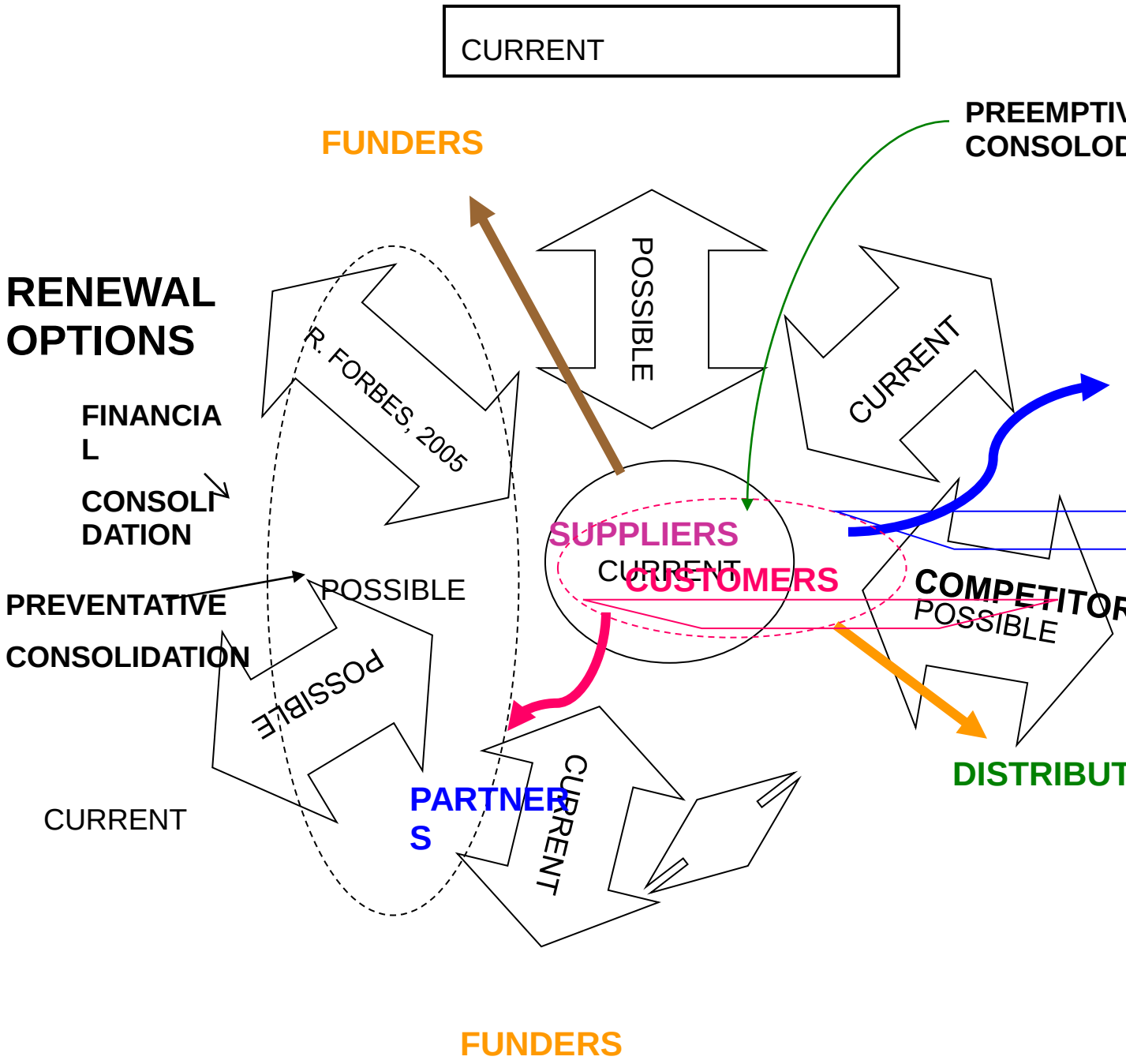

Figure 2

IT'S NOT NICE TO FOOL MOTHER NATURE

A popular TV commercial in the United States in the 1970s used an actress in the role of Mother Nature to powerfully and visibly display her wrath when she was given a margarine substitute instead of butter. Mother Nature was not amused and the supplier was left to suffer a catastrophic consequence. The dialog accompanying the video proclaimed that, " it wasn't nice to fool Mother Nature." Far from attempting to fool Mother Nature with another mechanistic approach to strategy development, this paper has discussed some possibilities for working in concert with nature. The intent of adapting or mirroring biological processes is to enable organizations to operate in an environmentally sustainable manner and to enhance the survival of the best fit.

In the case of developing and using effective business strategies Mother Nature may, in fact, know best. Potentially, organizations have a great deal to gain from employing nature-based strategies in the world of commerce. The strategic advantages to organizations of using biologically-based concepts are increasingly being discussed in the management literature. [11] [12]. One such specific strategic advantage to be gained is through superior marketplace innovation. In his recent work, *Dealing with Darwin*, strategy consultant Geoffrey Moore describes how great companies innovate throughout every phase of their lifecycle in order to compete strategically [13]. In particular, Moore shows how biological principles can be used to explain how successful organizations adapt to new technologies.

This paper has offered a means for CEOs who are operating in a global business environment to address some of their key strategic issues through the use of concepts and tools adopted from the field of biology. Lifecycle thinking has been used throughout as a means to clarify and develop organizational strategy. Additionally, a set of strategic principles has been provided to aid organizations in the process of strategy-making.

With millions of years of experience and innumerable tests of what works and what doesn't on the side of Mother Nature there is a great deal to be learned about why some living systems become perennially successful but so many more don't. It appears that in today's chaotic marketplace advantage is more likely to accrue to organizations that can develop strategies that fit both holistically and sustainably within their ecologies. We are just beginning to break the surface on how to select and implement business strategies that work together with rather than exploiting their environments. Additionally, we need to learn how to avoid setting up negative self-fulfilling strategic prophecies about business by using non-sports or non-warfare terms. Using metaphor s and constructs from the field of biology seems like a good place to begin this positive change in strategic thinking.

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