



■ Many companies are finding themselves part of—or competing against—highly networked systems of partners, customers, and suppliers.

■ As positional advantage is more easily challenged, multicompany systems extend the adaptive potential of an individual player.

■ Multicompany systems are able to innovate rapidly, leapfrog the experience curve, and quickly attain market leadership.

■ Adaptive systems require a less detailed “instruction set” that allows some aspects to emerge spontaneously from interactions among players.

Systems Advantage

This Perspective from The Boston Consulting Group’s Strategy Institute is the eighth in a series on the future of strategy. Earlier articles examined the central role of adaptive advantage in today’s turbulent and unpredictable business environment and the capabilities that contribute to it. This article discusses the importance of “systems advantage” in leveraging the power of multicompany systems to extend the adaptive potential of an individual organization.

“**O**ur competitors aren’t taking market share with devices; they are taking market share with an entire ecosystem.” This insight from Stephen Elop, Nokia’s president and CEO, explains an important aspect of the rapid rise of Apple’s iPhone and Google’s Android system in the global smartphone market.

According to traditional strategic paradigms, this swift and sizable competitive shift should not have happened. Nokia had the advantages of being an early mover and market leader with a strong cost position. If the experience curve were the key driver of success, the company would still be dominating the smartphone market. Yet Nokia was attacked by an entirely different kind of competitor: an adaptive business ecosystem. It was not simply Apple but its system of more than 200 component suppliers, multiple telecom partnerships, and innumerable independent application developers—all created to support the iPhone—that has proved so powerful. Google’s Android operating system also leveraged a broad array of hardware partners and application developers. The ability to bring together the assets and capabilities of so many entities allowed these smartphone entrants to leapfrog the experience curve and become market leaders in record time.

Nokia’s experience offers three lessons for today’s managers. First, competitive shifts are now occurring with blistering speed. Second, as changes in markets and technologies occur more frequently, positional advantage becomes less durable, and the value of adaptiveness increases. Third, a multiplayer ecosystem can be a highly effective lever for addressing this adaptive imperative.

There's a reason why companies are increasingly finding themselves either part of—or competing against—loosely organized groups of players and partners. Advances in information technology and telecommunications—from cheap bandwidth and computing power to online collaboration platforms—have enabled diverse sets of individuals and companies to interact quickly, richly, and on a greater scale than ever before.¹ Advances in shipping—such as the ease and efficiency that results from the universal standards of containerization—along with the steady erosion of trade barriers have facilitated the exchange of physical goods within systems. Finally, the potential of a systems approach is increasingly being demonstrated by a growing number of examples from firms such as Apple, Procter & Gamble, and Toyota.

Yet most executives lack a structured way to think about and create an advantaged system of actors. Traditional approaches to strategy focus primarily on the individual firm or business unit and are largely silent about managing a network of players beyond its boundaries.

But even if the broader playbook on “transcorporate strategy” has yet to be written, it is possible to define some emerging guiding principles for companies seeking to leverage a systems approach in order to extend their adaptive capabilities.

Properties of Adaptive Systems

An adaptive business system is formed by diverse players interacting in a semistructured fashion to achieve mutual business goals. Systems can take many familiar forms, including the following:

- ◇ Production systems that are orchestrated by a central player and that aggregate diverse capabilities, such as the iPod/iTunes ecosystem
- ◇ Collaborative production communities, such as Wikipedia or Linux
- ◇ Innovation networks, such as Procter & Gamble's extended ecosystem
- ◇ Marketplace platforms, such as eBay, Google AdSense, or the iPhone App Store

1. See the book *Blown to Bits: How the New Economics of Information Transforms Strategy*, by BCG's Philip Evans and Thomas Wurster, for a detailed discussion of *deconstruction*—the end of traditional vertical integration and a key trigger for adaptive multicompany systems. Here, we build on their pioneering thinking in this area.

Although the technology sector has proved fertile ground for business systems, the systems approach is not limited to the digital world. Collaborative supply chains—such as Toyota's automotive-supply pyramids, with their *kanban* and *kaizen* feedback mechanisms—are early examples of adaptive systems.

Systems can exhibit several properties that enable them to deal effectively with adaptive challenges. They can mobilize an extremely broad range of capabilities and assets, innovate rapidly through parallel activity, and distribute risk across many players. Their modular structure facilitates responsiveness to changing needs through recombination, speedy scale-up, and broad-based signal detection. (See the sidebar “Nature's Systems.”)

Nature's Systems

Biology teems with examples of adaptive systems. The human immune system, for example, exhibits adaptation that enables it to cope with an unpredictable and virtually infinitely diverse set of pathogens. In spite of its sophistication, it can mobilize itself against threats by using “rules” and properties intrinsic to the system, rather than taking direction from the brain in a top-down manner. Some of those properties include the following:

- ◇ *Diversity is enabled by modularity.* The recombination of modular molecular structures enables a small number of genes to generate a vast number of different antigen receptors.
- ◇ *Tight feedback loops facilitate rapid responses.* When activated by a particular pathogen, specialized cells accelerate the production of large numbers of specific antibodies to counter a threat.
- ◇ *Learning is built into the system.* Far from operating with a rigid design, the immune system “remembers” previous threats and adapts its tool kit to increase its effectiveness over time.
- ◇ *Redundancy is key.* The antibody response described above is only one of several overlapping subsystems of the immune system that enable it to respond to different kinds of threats over different timeframes.

As we continue to learn more about biological systems, we are likely to uncover many more insights into how to structure, evolve, manage, and sustain advantaged and adaptive business systems.

Although no business is an island in today's globalized and hyperconnected world, not every business possesses *systems advantage*—the ability to build and maintain a system of companies whose high collective adaptability enables them to perform together more successfully and sustainably than their competitors.

Guidelines for an Adaptive Systems Approach

In an increasing number of situations, traditional approaches to change taken by single enterprises acting alone are either too slow or too risky or lack sufficiently broad capabilities to enable successful adaptation. Although many situations might call for a systems approach, the following three are especially common across industries:

- ◇ To deal with high levels of product complexity or high demand for variety, a very diverse set of capabilities or assets is required.
- ◇ In periods of high uncertainty—which can occur whenever companies enter or create a new market—it is imperative to create a wide variety of options or to share risk.
- ◇ Situations of rapid or accelerating change in technology or customer demands call for the ability to conduct parallel experimentation with a diverse group of innovators.

Managing an adaptive system differs from managing a single company. For one thing, a system is more complex, with many more moving parts. Also, in a system there is less control over individual players—and a greater range of ambitions and motivations, some of which may conflict. As a result, the “instruction set” for systems is less detailed by design, and some aspects of the system emerge spontaneously from interactions among players over time.

We've studied adaptive systems in a range of contexts, from business to biology, to understand what makes them successful. Drawing on our analysis and from our own experience, we've developed nine guiding principles for creating and maintaining advantaged and adaptive business systems.

Establish common standards to enable frequent, low-cost interactions. A good example of the power of standardization is the introduction of freight containers with standard sizes. Containerization enabled a dramatic de-

cline in shipping costs and an order-of-magnitude increase in shipping traffic among diverse nations and companies as well as in modes of transport.

Foster trust among participants. To work together effectively, actors in a system need to trust one another. Trust can be nurtured by enabling players to interact frequently and transparently in a “repeated game” that relies on shared norms and that is often facilitated by an explicit reputational “currency.” One factor in eBay's success, for example, was the company's ability to accelerate trust among its members by enabling photos of products to be uploaded and by creating a mechanism for rating sellers—a scalable, visible form of trust.

Ensure minimal barriers to entry and sufficient rewards to motivate participation. Systems will form and persist only if they offer a compelling value proposition to current and potential members. Both the costs and benefits of participation (which needn't be entirely monetary) must be managed. Consider Qualcomm's Brew Mobile Platform. Despite debuting years ahead of Android, Brew has lagged in establishing a large community of application developers. Whereas the process for submitting Android applications is both quick and free, Brew—until recently—required developers to purchase an application submission kit for more than \$400 and endure a relatively cumbersome testing and approval process. In Android's first three years, Android applications were downloaded more than 1.5 billion times. By contrast, Brew applications accounted for less than half as many downloads in three times as many years.

Limit the portability of value beyond the system. For a system to be adaptive, members must be able to access and build upon the knowledge of others. But to prevent inadvertently benefiting competitors, companies must link the ability to extract value from intellectual property or other kinds of resources to participation in the system. For example, sellers with a high rating on eBay have a documented monetizable asset: their price realization is 6 to 8 percent higher than that of unrated or poorly rated sellers. Because that rating is specifically linked to the eBay community, however, it would be difficult for sellers to monetize that reputation outside the eBay system. Thus, these sellers have an interest in the continued success of eBay.

Preserve redundancy. Adaptive systems typically have redundant communication pathways and multiple members capable of executing critical functions. These features ensure that the system cannot be crippled by the

loss of any individual member or by changes in needs or roles.

Facilitate diversity within the system. Systems must have a diverse set of participants and capabilities so that they foster innovation and adaptation in times of change. Indeed, the diversity of contributors in open-source systems such as the iPhone application network and Linux has been central to those systems' continuing success. During stable periods, pressure from competition and the desire for efficiency can tend to reduce diversity as a system moves toward equilibrium. To sustain adaptive capacity, it is critical to maintain diversity within the system by continually seeking potential new members and enabling them to contribute their unique capabilities, assets, or insights to the system.

Cultivate flexibility in the system. As interactions become trusted relationships over time, the perceived cost of change increases. This shift can cause a system's structure to become rigid—inhibiting the recombination and introduction of new capabilities that are essential for innovation and adaptation. Firms can cultivate flexibility by building modularity and interchangeability into their products and business systems, by avoiding exclusive long-term contracts, and by constantly looking for new partnerships in response to change.

Ensure tight feedback loops. To maintain the system's adaptability, participants must be able to readily identify and respond to internal or external changes. Wal-Mart fosters such feedback by frequently sharing real-time sales data with its suppliers, which can then respond with appropriate changes in distribution and stocking. Suppliers that use the information to meet Wal-Mart's expectations on inventory metrics are able to share in the resulting benefits, including reduced transaction costs and fewer stockouts.

Determine what to structure and when to relax control. A good rule of thumb is to enforce the mechanisms that enable productive interaction among members while relaxing constraints on who interacts with whom, as well as on specific outcomes and activities. For example, iPhone maintains tight control over its OS platform and hardware specifications to ensure a consistent, high-quality user experience, but it exerts minimal control over the details of application development in order to foster creativity and innovation.

By following many of these principles, Procter & Gamble has pioneered an exemplary holistic approach to systems advantage through a series of programs aimed at

leveraging external insights and capabilities. It established Connect + Develop, an open-innovation platform designed to solicit new ideas from outsiders; created the YourEncore community of retired engineers and scientists to solve difficult R&D problems; and launched the Vocalpoint community of more than 500,000 mothers who receive early access to new products in exchange for sharing their opinions about them.

These system-oriented efforts provide product-development teams with new ideas and critical feedback and enable them to adapt quickly to changes in the market. These initiatives have helped boost R&D productivity by 60 percent in just a few short years.

Moving Toward an Adaptive System

If you are among the many business leaders who are concerned about rapidly rising product complexity and variety, market uncertainty, and accelerating change in technologies and markets—or if you are struggling with how to maximize the strategic value of your growing list of external partners—the following questions will help you prepare to create a systems advantage:

- ◇ How could a systems approach benefit our business?
- ◇ Who might we want to participate in the system and how could we motivate them to participate?
- ◇ What platforms do we need to build or establish in order for the system to emerge?
- ◇ Which elements of the system should we standardize or control?
- ◇ Which elements of the system should we leave flexible and open to creativity and innovation?
- ◇ What do we “give away” and what do we control to sustainably capture value from the system?
- ◇ Which mechanisms do we need to ensure and maintain the adaptive capacity of the system?

A cruel paradox of competition—observed in business as well as biology—is that the efficiency and specialization that enable a competitor to excel in one environment often inhibit successful adaptation when the environment changes. Thus, in highly demanding and dynamic environments, the challenge is to find a strategy that enables specialization without rigidity. Adaptive systems can help companies answer that challenge

by bringing together a diverse set of specialized capabilities in a flexible fashion—and thereby conferring competitive advantage on a sustained basis.

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This article is the eighth in a series on the adaptive imperative.

For the earlier Perspectives in the series, see “New Bases for Competitive Advantage: The Adaptive Imperative” (October 2009), “Adaptive Advantage” (January 2010), “Signal Advantage” (February 2010), “People Advantage” (March 2010), “Social Advantage” (June 2010), “Simulation Advantage” (August 2010), and “Adaptive Leadership” (December 2010).

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