CHAPTER 1

# The Evolution and Future of Corporate Business Structures



In 1991, Ronald Coase won the Nobel Prize in economics after a lifetime of influence that began with the 1937 publication of his renowned paper entitled ''The Nature of the Firm.'' In this paper, Coase asked (and then answered) the lofty question of why corporations form in a free market economy. Coase's point was simple: If there really are free and efficient markets, then a corporation can get any service it wants from a free market of independent contractors. Despite this free market, however, he cited the range of additional costs related to searching for, contracting, coordinating, and eventually paying for these services. And he showed how these costs ultimately made it more expensive to secure services in the open market versus bringing them in-house.

Coase went on to say you could measure the size of a firm by the number of contractual relations it creates, and by the number managed internally versus externally. As a result of the added expense related to external relationships, he showed how companies could then bring more and more of their contractual relationships inside in order to gain efficiencies and lower their transaction costs. This approach is what drove the creation of big, vertically integrated corporations in the twentieth century. That was the world according to Coase in 1937.

Today, a company is still motivated to bring more and more of its transactions in-house, but only until the cost savings gained are offset by other costs. Those other costs come in the form of management information overload and the resulting inefficiencies in decision making and allocation of assets.

Many companies are now bumping up against those limits. In particular, with the spread of the wireless Internet, mobile computing and business application services delivered over the Internet, it is becoming easier and less expensive to manage external contractual relationships and transactions. Instead of being optimized for internally focused inside-out communications, companies are being transformed and reoptimized for outside-in communications.

The classic hierarchical organization structure of twentieth century companies is being redesigned and this gives rise to the network organization structure of the virtual enterprise. In the virtual enterprise the activities performed internally are those that directly add value to the company's products and which its customers pay it for doing.

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> Since we can now use technology, the Internet and open standards to begin to automate, standardize and integrate business processes, those transaction costs described by Ronald Coase are dropping precipitously. Consequently, the whole nature of the firm, and what it means to run an efficient business, is going through very extensive changes. These are not easy changes. Not only is there a great deal of innovation required to automate and integrate business processes, but perhaps more important, there are even greater changes in culture required to transform Industrial Age business models to something more appropriate to our Internet era.[1]

By having common standards for common transactions like purchase orders, order processing, billing, accounts payable, and so on, firms gain tremendous flexibility and they can change and adapt easily as situations evolve. Weaving technology into these transactions, and combining them with common service delivery standards, improves a company's ability to deal with a wider ecosystem of service providers. This enables companies to shift their culture and their processes so they have access to the talent and services as the need arises.

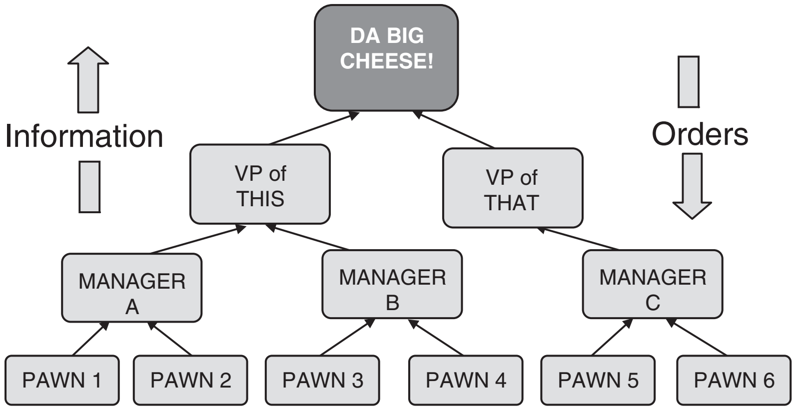
This redefines the basic culture of the firm. This notion of learning how to collaborate has become a key driver of wealth creation. Firms learn to live in their marketplace or they lose touch with their customers and cannot follow them as needs and desires change. With industrial technology the object is efficiency and low cost, with service technology the object is customer satisfaction in whatever form that may take for the markets being served.

## Example of a New Corporate Organization Structure

The days of the traditional pyramid-shaped corporate hierarchy as a viable business model are coming to an end. The past 20 years have produced some winners and some losers, and some of the biggest losers are companies that built themselves into huge conglomerates that were supposed to be too big to fail. Instead they are proving the truth of the saying, ''The bigger they are, the harder they fall.''

It's not that companies can't be big and grow revenue to many billions of dollars. It's that they have to swear off that fatal tendency to organize themselves as hierarchical pyramids where most people are powerless drones who just follow orders while the important decisions are made by a small group of powerful executives at the top of the pyramid. Given the pace of change, companies need something more agile and responsive. As shown in Figure 1.1, an inevitable consequence of organizations using the pyramid-shaped hierarchy is that there is a decision-making bottleneck at the top of the organization. No small group of executives, regardless of their smarts, hard work, or sophisticated computer systems, can make all those decisions in a timely or competent manner.

People at the top of corporate hierarchies are overwhelmed by the sheer volume of decisions they have to make; they are too far away from the scene of the action to really understand what's happening; and by the time decisions are made the actions are usually too little and too late. Companies suffer the consequences of this performance by staggering from one bad decision to another like punch-drunk boxers who can't understand what's happening and can't understand why they keep getting hit.




Centrally controlled hierarchies move SLOWLY because only a few people know what the strategy is and everybody else waits for permission to act.

**Figure 1.1 Traditional Organization Structure**

Cisco Systems got hit hard in the collapse of the dot-com bubble in 2002 when their stock went from around $77 a share to around $11. But they took that opportunity to learn some lessons that many other companies are only now starting to consider. Because human nature is what it is, it often takes a ‘‘smack-up-side-of-the-head’’ event to send a wake-up call and get us to consider new ideas and try out new ways of doing things.

The good news is that we really can learn from mistakes when we decide to do so. Cisco used to be a traditional pyramid-shaped corporate hierarchy where all the important decisions were made by a small group of senior executives at the top of the organization chart. Then they fell on hard times. What has emerged in the past several years is an agile enterprise with a network organization structure (see Figure 1.2) where decision making is decentralized out to some 500 managers and the whole operation is powered by Internet-based collaborative technologies like blogs and wikis and social media tools, some of which they have built themselves.

Now instead of a small group of executives telling everybody else what to do, people have authority to figure out for themselves what to do. People are motivated to coordinate, cooperate, and collaborate with each other by a financial incentive system that rewards them for their common successes instead of rewarding each manager for their individual successes.

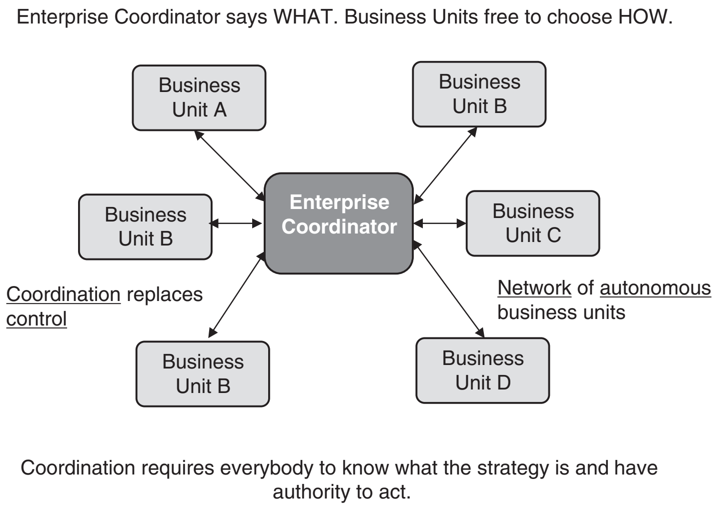



**Figure 1.2 New Organization Structure**

Cisco's CEO John Chambers makes the case that Cisco's new business model is ''the best possible model for how a large, global business can operate: as a distributed idea engine where leadership emerges organically, unfettered by central command.''[2] Cisco is also sharing what they've learned with big customers like AT&T, General Electric, and Procter & Gamble.

Is there a winning business model here that other companies could put to use? What kind of IT systems architecture would best support this type of business model?

## Model of a Responsive Organization

The business model used by Cisco and other responsive organizations is to give their business units a high degree of autonomy in how they reach their business goals and encourage them to constantly explore their markets and look for new opportunities. The business units in these companies are organized as networks instead of hierarchies simply because network organization structures allow for greater business unit autonomy.

These companies support their network organization structure of autonomous business units by using a shared services model. In this model there is a central enterprise coordination unit that sets goals and overall strategy and provides the other business units with administrative, finance, and systems support services. This frees the business units from taking on those tasks and those expenses so they can focus on the activities that generate revenue. This also enables the company to take advantage of economies of scale in delivering these support services.[3]

As they grow, these companies keep their organizations from evolving into rigid hierarchies by following a practice of forming new business units to pursue new products and markets. Instead of letting one original business unit get larger and larger as it grows its business and enters new markets, that original business unit takes on the role of the enterprise coordinator for a host of new business units. And these new units handle the growth of existing businesses and the expansion into new markets. This is illustrated in Figure 1.3.

The evolution of corporate organization structures like this is driven by the convergence of economic necessities with technological capabilities. The need to be responsive to evolving customer needs and desires creates networks where decision making is pushed out to operating units closest to the scene of the action.

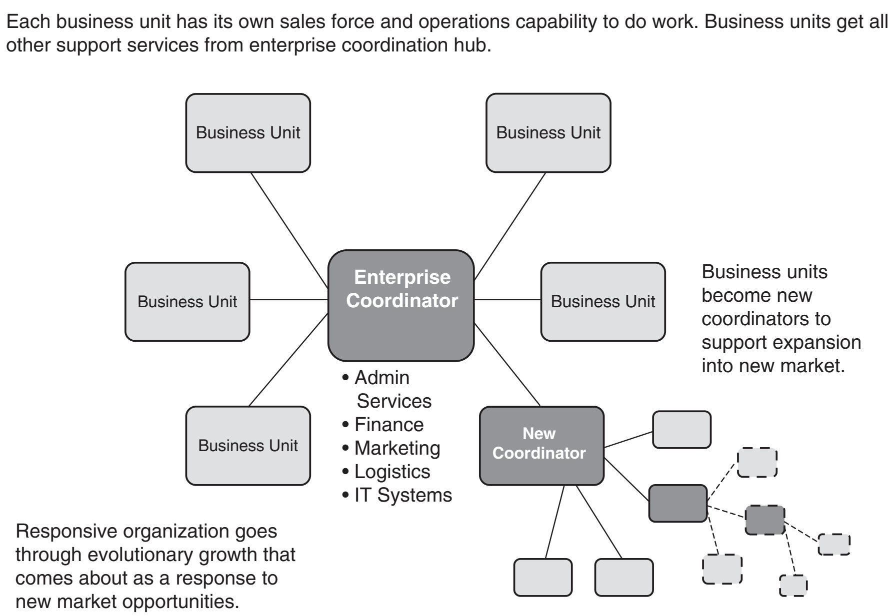



**Figure 1.3 Structure of Agile and Responsive Organization**

And these network operating structures are supported by a mix of telecommunication and computing technologies that enable services to be delivered anywhere at any time over the Internet.

This mix of technologies and services is now known as ''the cloud'' or as ''cloud computing.'' The industry research firm International Data Corporation (IDC) defines cloud computing as ''Consumer and business products, services and solutions delivered and consumed in real time over the Internet.''[4]

In the words of an article entitled ''The Long Nimbus'' published by the *Economist* magazine about the impact of cloud computing on company organization structures, ''Businesses are becoming more like the technology itself: more adaptable, more interwoven and more specialized. These developments may not be new, but cloud computing will speed them up.''[5]

These trends combine to produce companies and operating procedures that are much more fluid and flexible than what came before. Instead of procedures moving in a predictable straight-line fashion from start to finish (as in linear assembly lines), business processes now move in patterns that are circular and iterative and constantly adjusting to meet changing circumstances. These new processes are not industrial in nature; they are cybernetic in nature.

## A Cybernetic Economy

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In this book he states that the Internet and mobile computing and digital media are giving rise to what he calls the third industrial revolution and business models that are ''cybernetic, not linear.'' Instead of the linear, start and stop assembly line model of the twentieth century's second industrial revolution, business is now about access to services instead of ownership of products. Business is no longer about transactions that record one-time purchases but is instead about "an ongoing commercial relationship between parties over time."[7]

Instead of purchasing music CDs, customers now buy membership in organizations that provide them with access to huge libraries of music, which they can access for their personal use. Instead of buying a car, many people are turning to membership in companies like Zipcar and iGo that provide them with the use of a car when they need one. Successful companies increasingly focus on wrapping their commodity products in blankets of value-added services that are constantly tailored to meet evolving needs and desires of specific customer segments.

Even for the most basic products, the shift toward a service orientation is evident. Take commodity products like floor wax and mops and consider this question: Do customers want floor wax and mops or do they want shiny floors? In most cases customers want shiny floors, not wax and mops. The profit opportunities and areas for business growth lie in innovative and responsive services that a company can wrap around its otherwise commodity products.

Those companies that consistently offer customers the right blend of products and services can consistently earn profits that are two to four percent higher (and sometimes more) than industry averages. This service-based additional profit can be thought of as the "agility dividend."[8] And this agility dividend is perhaps the most promising and sustainable source of profits for companies in our real-time global economy where products by themselves are so quickly commoditized.

A business model optimized for delivering this evolving mix of services to customers in an ongoing relationship over time clearly requires a different organization structure than the traditional hierarchical structure that supported businesses optimized for selling products to customers in one-time transactions. And with any new organization structure comes the need to find new processes for control and communication in that organization structure. The centralized command and control methods that worked for hierarchies will not work for service delivery networks.

The science of cybernetics describes the control and communication processes that work best for network organizations. So familiarity with some basic principles of cybernetics is helpful in exploring how responsive network organizations operate.

## Cybernetics Is about Control and Communication

The word *cybernetics* was first defined in the late 1940s for use in scientific and engineering discussions about the operations of specific systems. In the past 30 years the word has been modified by popular culture to take on meanings that were not originally intended. Cybernetics has been sensationalized and now often implies something futuristic and computerized and either very cool (as in ''cyber-space'') or very ominous (as in ''cyborgs'').

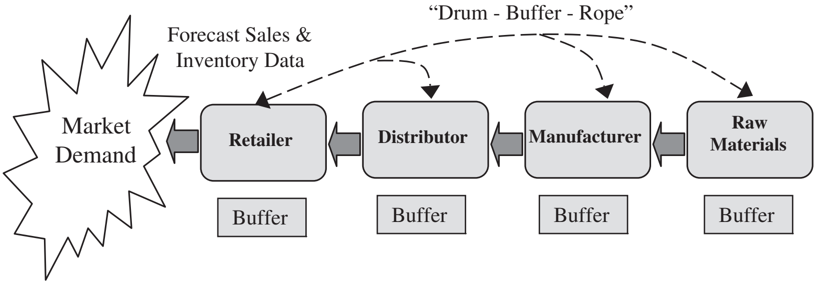
Norbert Wiener, a professor at the Massachusetts Institute of Technology, coined the term *cybernetics* in his book by the same name published in 1948.[9] He derived the word from the classical Greek term for steersman—*kybernetes*. In Wiener's words, cybernetics covers ''the entire field of control and communications theory, whether in the machine or in the animal.''[10]

The core of cybernetic research is the discovery that the same laws govern the control and operation of processes in any system whether that system is mechanical, electrical, biological, economic, or social. This means that the structure and workings of any process can be described and investigated using the same terms and relying upon the same principles.[11] Thus, researchers and practitioners in different fields can use a common language and build upon each other's knowledge.

### *Feedback Loops*

Central to the understanding of cybernetics are the concepts of feedback and homeostasis (see Figure 1.4). There are two kinds of feedback: positive and negative, and both kinds of feedback operate through the use of communication feedback loops. Homeostasis means a state of equilibrium or balance. Many processes can be seen as operating to regulate or maintain a predefined equilibrium state. Let's look at each of these concepts in a bit more detail.

- *Positive feedback.* This occurs when the output of a process creates input to the process that accelerates its production of more of the same output. The effect of positive feedback is additive. It produces a result that continually builds upon itself. There is a snowballing effect. Positive feedback moves a process from one level of performance to a different level of performance. If left unchecked, positive feedback leads to the




Real-time visibility of relevant data enables companies to collaborate and adjust the flow of inventory to meet fluctuating market demand.

- Market demand sets **drum** beat or tempo of supply chain.
- Manage uncertainty with **buffer** of either inventory or production capacity.
- Data is **rope** that ties supply chain together and enables self-adjusting feedback loops to operate.

**Figure 1.4 Feedback Loops Drive a Real-Time Supply Chain**

equivalent of an explosion or a collapse. Examples of positive feedback are a chain reaction in a nuclear reactor, a population explosion, or the growth of capital over time due to compound interest.

- *Negative feedback.* Negative feedback happens when the output of a process creates input to that process that moves the process toward a predefined goal or performance level. Negative feedback is corrective. The desired performance of a process is continually compared with its actual performance, and the resulting difference is used to take corrective action. The process adjusts its performance so as to minimize the difference between desired output and actual output. Examples of negative feedback are the operation of the cruise control in a car, which operates the car's engine to maintain a predefined speed, or the operation of a thermostat, which operates a heating unit to maintain a room's temperature at a predefined level.
- *Homeostasis.* Homeostasis is defined as the point at which the process is operating at just the right level so as to be in balance with its environment or with the expectations that have been set for it. The action of negative feedback on a process constantly moves the process toward the performance level that is defined as homeostasis. The action of positive feedback on a process can result in moving the process to a new level

of performance and thus a new level of homeostasis. So, it is negative feedback that maintains homeostasis and positive feedback that changes the definition of homeostasis.

### *General Systems Theory*

During the 1950s and 1960s, people built on the insights provided by cybernetics. At the end of the 1960s Professor Ludwig von Bertalanffy published a book entitled *General Systems Theory*[12] that pulled together and expanded upon material he had published in various articles and scientific papers over the previous 25 years. He noted that in surveying the evolution of modern science a significant fact emerges: that researchers in different fields like physics, chemistry, biology, economics, and sociology who pursued independent lines of inquiry all wound up encountering similar problems and created similar concepts to deal with these problems. The concept of a system has a rigorous definition that applies in whatever discipline or application area being discussed.

To begin with, all systems demonstrate the properties of coherence, pattern, and purpose. This means all the components of a system are interrelated in some discernable and coherent way. These interrelationships form recognizable patterns that give structure to a system. And the workings of a system are not random; it acts in a purposeful way to accomplish a goal or set of goals.

Systems are also self-regulating and persistent. Disturbances to a system from its environment will trigger interactions between the components of the system enabling it to recover from the effects of the disturbance and regain a state of equilibrium or homeostasis. This is what allows a system to persist over time in a changing environment.

## Profit Potential of Self-Adjusting Feedback Loops

In an agile and responsive organization, business processes and business units must manage themselves as much as possible and not rely on centralized command and control systems. Cybernetics and General Systems Theory show us ways to design these processes. By using information flows and negative feedback loops, a company can design and implement processes that continuously correct business unit behavior in order to steer the company toward predefined performance targets. In this way, self-managing processes amplify the productivity of the company's employees.

The self-adjusting feedback loop is a very useful phenomenon. If feedback loops can be harnessed to drive business processes as efficiently as we have learned they can to drive mechanical and electrical processes, then companies can achieve whole new levels of productivity and profitability.

At present, the operating processes of most companies are rigid and inflexible. They are set for a certain way of doing things and they do not change even when those ways of doing things are no longer delivering the results that people want. Processes change only under great pressure and then they settle into a new but still rigid mode of operations that will in turn have to be changed again, under great pressure, when they no longer deliver the results that people want.

If cybernetic feedback loops were harnessed to drive business operations, then those operations would become much more flexible and fluid. Cybernetic processes are continuously adjusting to changing circumstances. Instead of waiting for a business process to drift far off course as conditions change, feedback loops can continuously adjust and reshape a business process to respond effectively as situations evolve. Cybernetics involves a mix of positive and negative feedback loops that are employed as needed to keep a business process aligned with the needs and desires of the people they serve.

Negative feedback occurs when a system compares its current state with a desired state (or goal) and takes corrective action to move it in a direction that will minimize the difference between its present state and its desired state. A continuous stream of negative feedback guides a system through a changing environment toward its goal. Negative feedback continually corrects and improves an existing process.

Positive feedback occurs when a new action or process or product generates a desirable response so the system is induced to do more of what produced the positive feedback. Positive feedback creates new processes and new systemic capabilities that did not exist before. Positive feedback creates change. It moves a system to a new position of homeostasis: a new state of equilibrium.

Computers are best used to automate the routine and repetitious activities that make up the bulk of most business operations.

Computers are good at harnessing negative feedback loops to continually adjust and improve existing operations and locate exceptions to business rules. Computers monitor massive amounts of data in real time and don't miss details, and they can scale up quickly to process enormous volumes of data as business volumes grow.

People are best used to do the creative and problem-solving activities. People are good at harnessing positive feedback loops to create new things and new processes to produce those new things. These are the activities that don't have clear right or wrong answers. These are the activities that call for people to collaborate with each other and share information and try out different approaches to see which ones work best. People are good at these activities and they like doing them, so they learn and keep getting better over time as they gain more experience.

The spread of cloud computing and near universal real time access to computing power and data is creating an opportunity to leverage the power of self-adjusting cybernetic feedback loops across entire companies and entire trading networks and value chains. Real-time data sharing and close coordination between companies can be employed to deliver continuous operating adjustments that result in steady cost savings over time (negative feedback) as well as the delivery of timely new products and services that result in significant new revenue (positive feedback).

The effect of these continuous adjustments and enhancements to business operations can generate a steady stream of savings and new revenues that may sometimes seem insignificant from one month to the next, but as years go by, they become analogous to the growth of capital over time due to the humble but powerful effects of compound interest. The profits generated this way can be thought of as the agility dividend.

How can the power of the self-adjusting feedback loop be brought to bear in a business process such as a supply chain in such a way as to generate an agility dividend? One way to do this is the transparent use of performance-based bonuses. People do what they are incentivized to do. If companies provide people with clear performance targets and timely data that shows them if they are moving toward or away from their performance targets and allows them to see the effects of their actions, then a feedback loop comes into existence.

Companies are starting to use systems that provide web-based performance dashboards to display performance data for their internal operations and performance data for their suppliers. These dashboard displays are generated in real time or near real time by business intelligence (BI) and business process management (BPM) systems that monitor data flowing inside companies and between companies.

When companies set desired performance targets, BI and BPM systems allow companies to monitor actual performance and constantly adjust operations to move closer to desired performance. These continuous operating adjustments generate quantifiable benefits and business profits that can then be used to reward people for the effort needed to achieve these targets. The availability of real-time performance data plus people's desire to receive rewards is what brings the self-adjusting feedback loop into being.

When people's interactions with each other are cast in the form of a game whose object is to achieve a set of predefined performance targets, the resulting real-time feedback loops will strongly influence people's behavior. If companies and people in a supply chain or any other business process have real-time access to the data they need, then they will steer toward their targets. If they are rewarded when they achieve their targets, then they will learn to hit these targets more often. The profit potential of the self-adjusting cybernetic business model is now unleashed. This concept is illustrated in Figure 1.5.

## Viable Systems Model: A Framework for Business Agility

Stafford Beer explored the application of cybernetic principles to business and its effect on the design of business organizations. He was a cybernetic theorist, a professor at the Manchester Business School in the United Kingdom, and consulted with companies and national governments on applications of his cybernetic theories. He is widely recognized as the founder of management cybernetics, which he defined as, ''the science of effective organization.''[13] He synthesized many of his ideas into what is known as the viable systems model.

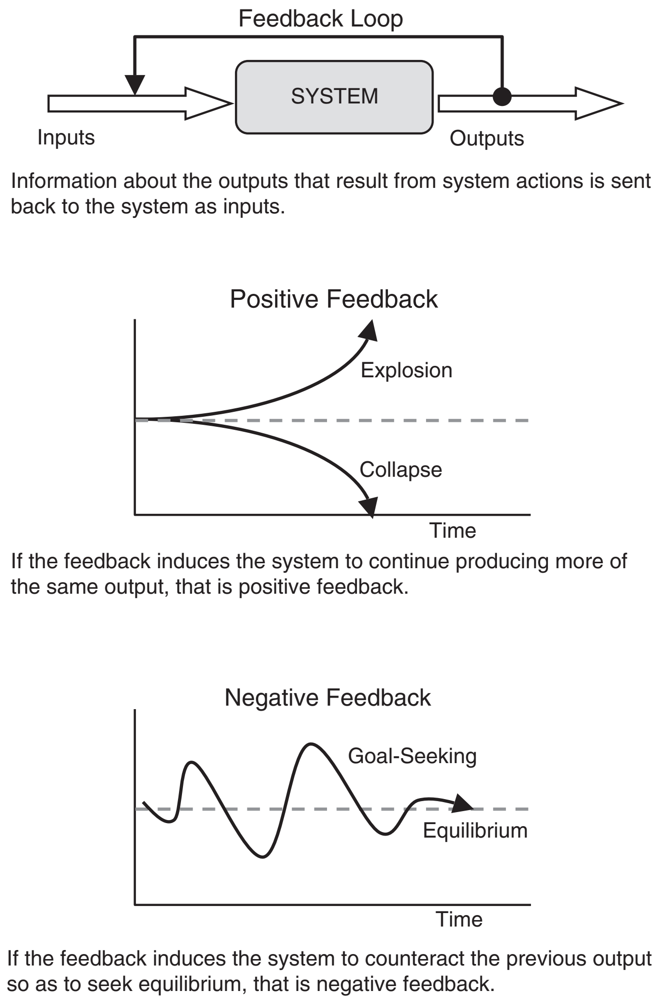



**Figure 1.5 The Power of Real-Time Visibility**

The viable systems model looks at a company as if it is a living thing and describes how it should be structured to operate most effectively in its environment. Stafford Beer published two books—*Brain of the Firm* and *The Heart of Enterprise*—that explain the viable systems model[14] and provide examples of how to put it to use to achieve agility.

### *Model for an Agile and Responsive Organization*

The viable systems model views any situation as being composed of three parts: (1) the environment; (2) the operations performed by an organization in this environment; and (3) the metasystem activities of coordination, planning, and goal setting created by the organization. This is illustrated in Figure 1.6.

Next, the model identifies five subsystems that make up the operations and the metasystem of any viable system. These subsystems are referred to as Systems 1, 2, 3, 4, and 5 (see Figure 1.7). Let's take a closer look at each of these subsystems.

System 5 is analogous to our higher brain functions. It defines the system's identity and its overall vision or reason for being. This system decides on operating policies and guidelines that the whole organization will follow and, from an information technology (IT) perspective, is supported by business intelligence and simulation systems.

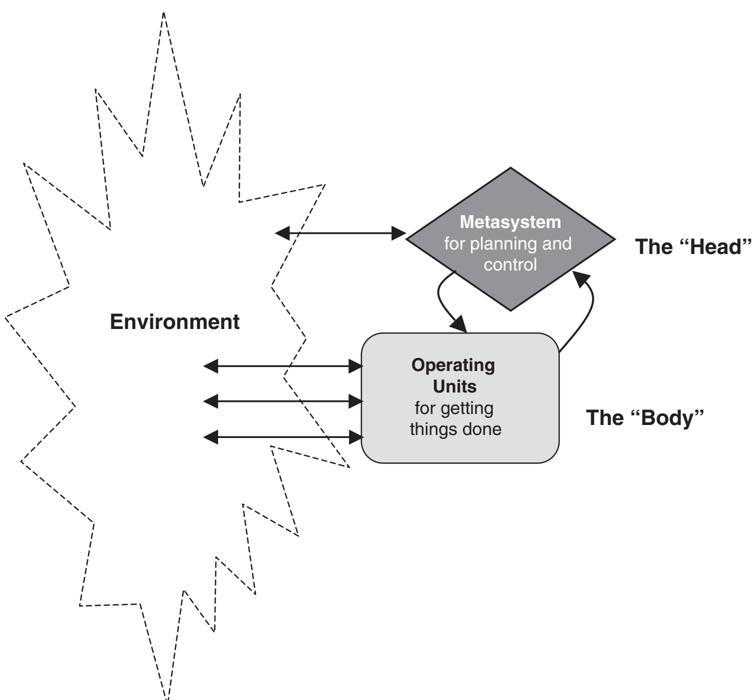



**Figure 1.6 The Viable Systems Model**

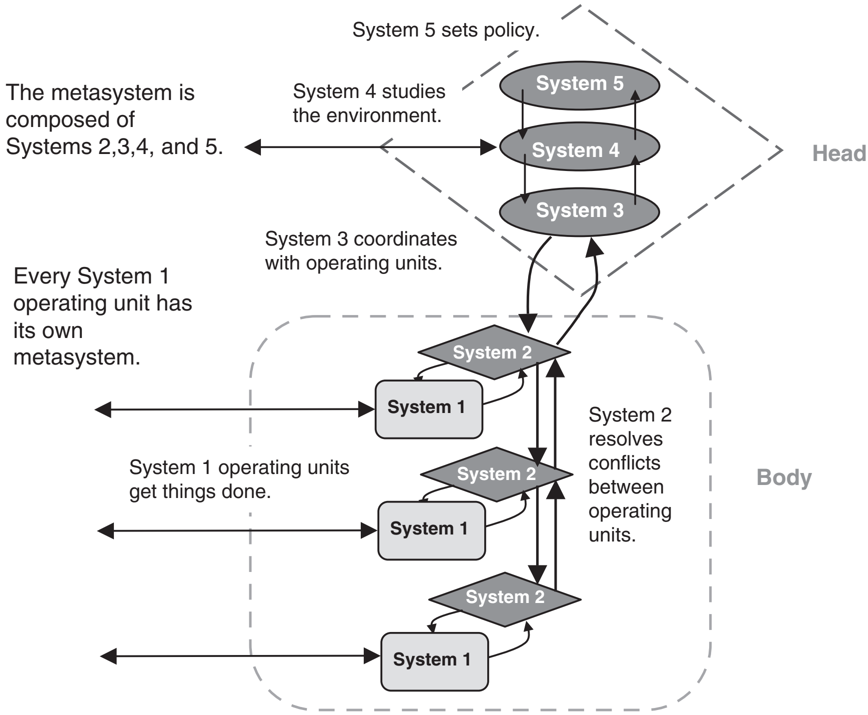



**Figure 1.7 Viable Systems Model—Subsystems 1, 2, 3, 4, and 5**

System 4 is like our conscious nervous system. It looks out at the environment, collects information, and makes predictions and forecasts about the environment. It also picks strategies and makes plans for best adapting to the environment. IT systems that support these operations are systems like BI and simulation modeling. System 4 functions are also supported by technologies known as complex event processing (CEP) systems. CEP systems filter through multiple data streams emanating from other systems looking for predefined patterns or sequences of data that would indicate situations of interest to the organization.

System 3 is the system that looks across the entire body of muscles and organs and optimizes their collective operations for the benefit of the whole body. This system also performs functions that are analogous to those of the autonomic nervous system. In addition, System 3 is responsible for finding ways to generate synergies between operating units. From an IT perspective this operation is also supported by BPM and CEP technology, and BI also has a role to play.

System 1 is the collection of operating units that carry out the primary activities of the organization. System 1 is composed of all the operating units that actually do something. This is analogous to the muscles and organs in the human body. From an IT perspective System 1 is supported by transaction processing systems like order entry, delivery scheduling, and customer relationship management.

System 2 is like the autonomic nervous system that monitors the interactions of the muscles and organs. This is the system that has responsibility for resolving conflicts between operating units and for maintaining stability. From an IT perspective this operation is supported by BPM and CEP systems.

### *What the Viable Systems Model Means*

The model states that in order for a system to be a viable system it must be able to create, implement, and regulate its own operating policies. This means a viable system needs to have the five systems described in the previous section. If a system cannot create, implement, and regulate its own policies then it is a component part of some other system because such a system all by itself would not have the ability to sustain itself over time.

It also emphasizes that the individual operating units (the System 1s of an organization) need to be as autonomous as possible. They need to be free to devise and execute their own operations within predefined performance ranges and areas of responsibility. Each System 1 operating unit is actually a microcosm of the entire system. Each operating unit contains its own Systems 1 through 5. In other words, the viable systems model is a fractal organization; it is a set of repeating components and processes that manifest themselves at lower and lower levels of detail within the organization.

Because each System 1 operating unit is autonomous and self-regulating (this is what makes agility possible), their activities are not directly controlled by Systems 2 and 3 but instead they are coordinated through the action of feedback that occurs between Systems 1, 2, and 3. Systems 2 and 3 monitor data generated by System 1 and look for changes in status or for indications that an operating unit has gone outside of agreed-upon operating parameters. BPM technology is designed to perform these monitoring tasks.

When a status change or an out-of-range condition is detected, Systems 2 and 3 send this information back to System 1. This sets up either a positive or negative feedback loop that guides the activities of the individual operating units and brings them back into line. Response by an operating unit to feedback from System 2 or 3 allows it to regulate its own behavior and respond as needed. (This is what it means to be agile.)

Response to feedback should not be confused with just following an order. System 2 or 3 does not order System 1 to do something. Instead, the guiding effect produced by feedback between these systems is an alternative to centralized command and control. This enables each System 1 operating unit to act autonomously. And this autonomy allows each unit to think and act on its own as long as it stays within agreed-upon limits. The viable system as a whole then benefits from the initiative and responsiveness displayed by the autonomous operating units. As well, Systems 2 and 3 are not bogged down trying to do the thinking for System 1, so they do a better job of monitoring, coordinating, and maximizing overall system performance.

## A Cloud-Based Model for Business Organizations

The metasystem functions that Stafford Beer described are very similar to the functions performed by the enterprise coordinator in the model of a responsive organization discussed at the beginning of this chapter. If we merge these two models and put the metasystem and coordination functions in a cloud-based technology environment, we get a model of what cloud-based business networks could soon look like.

It makes sense to place the metasystem and coordination functions in the cloud because these are collaborative activities and the cloud is a highly effective platform for collaboration between different companies. Business intelligence and simulation systems in the cloud can provide all the companies in the network with transparency and visibility so they can all see the real-time status of network operations. Cloud-based simulation modeling systems can then provide all companies in the network with a common collaborative platform for testing out new operating processes.

Decision makers from the different organizations in the network can then engage in a fact-based collaborative decision-making process. A process called simulation gaming can be used to evaluate the effectiveness of different decisions. These simulations will show the most probable results of different decisions so that it becomes clear which decisions will best advance their common interests. The simulation gaming process is immersive and inclusive and those qualities will tend to generate consensus among the decision makers. (We'll later discuss this application of what is known as ''serious games'' in Chapter 10.)

It also makes sense to put the communication and coordination functions in the cloud because that provides companies with a common data transport and communication system in which they can all connect. Cloud-based systems have well-defined application program interfaces (APIs) so each company can use service-oriented architecture (SOA) techniques to connect their internal systems to a cloud communications backbone. This is illustrated in Figure 1.8.

Will cloud-based systems built with BPM, CEP, BI, and simulation gaming come together as cloud-based management and governance models for entire industries? This could be the formation of integrated sets of real-time workflow processes that are tailored to specific vertical industries. And these systems could evolve over time to embody field-tested libraries of industry best practices that enable highly responsive and profitable business processes in specific vertical markets.

Cloud-based trading networks like this would then enable the formation of entire business ecosystems. They could, in effect, become the equivalent of global industry operating systems. As these industry operating systems take shape, they could evolve as open source or proprietary operating systems. Will a single company own the operating system or will larger groups of companies own the operating system in common? It's way too early to tell.

Companies may be more inclined to join networks where they have some ownership and greater influence in the decision-making procedures employed by the network. On the other hand, proprietary operating systems may be more efficient and faster to react to changes because fewer people are involved in the decision-making process. Ultimately, the dynamics of these two models could turn map to those of centrally planned economies versus free market economies.

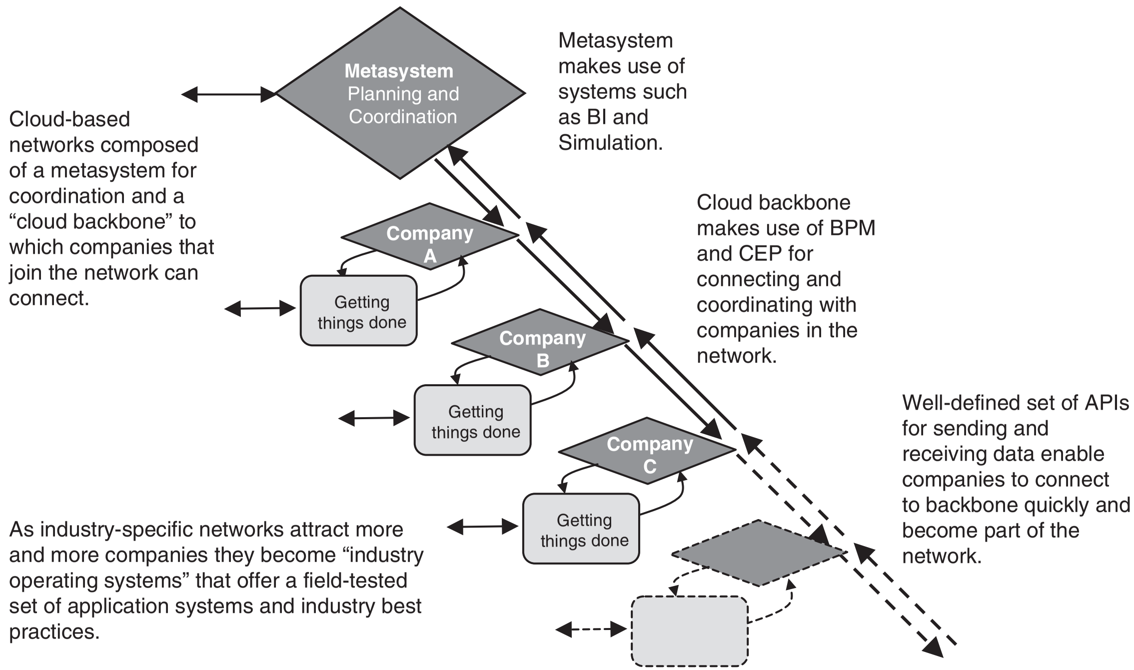



**Figure 1.8 Cloud-Based Business Network**

## Notes

1. Irving Wladawsky-Berger, ''The 'Outside-In' Enterprise,'' October 10, 2005, blog post http://irvingwb.typepad.com/blog/2005/10/the_outsidein_e.html.
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