



The Rise of the Networked Organization

Introduction

In 1600, when the British East India Company set out to trade with Asia on behalf of Queen Elizabeth I, it marked an historic moment—and it wasn't related to tea. Most Americans remember the British East India Company for its bit part in the Boston Tea Party and the start of the American Revolution.

But the founding of the company marked a different revolution—the launch of a progressive, profitable capital structure—that has broad implications for organizations seeking to operate more effectively and improve profits today.

In what was considered a fairly new practice at the time, 80 adventurers invested in the company in return for a share of the profits of the Asian spice trade. Early voyages earned a 148% return. By 1613, the company issued its first joint-stock offering. Thus, the British East India Company was one of the first—and most successful—limited liability joint-stock companies. Its descendents populate every stock exchange and have transformed business worldwide. Risks too large for one merchant or monarch could now be undertaken by collective action. Wealth multiplied, as did competition.

The rise of the British East India Company illustrates a larger pattern. Throughout history, management innovation has given rise to new business models that change the very nature of competition and determine who wins and who loses, who prospers and who doesn't.

While management structures ultimately make the difference between a company that adjusts to the environment of the 21st century and those left behind, technology, particularly technology that influences how people and machines communicate, plays a central role in bringing new business structures to the fore. Why? Because better communication can improve coordination, deepen control, decrease risk, and even substitute information for physical assets. These capabilities make it easier to adjust how an organization is arranged and operated. In other words, technological advances help a company increase its scale and scope, learn faster from its environment, and improve the speed and accuracy of its operations.

I. Technology & the Evolving Organization

II. History Repeats Itself

III. The N-Form Organization

IV. Management Challenges

Technology also influences the rate at which management innovations occur. With each new technological advance that's added, the evolutionary cycle—by which organizational structures are created, maximized, and discarded—contracts. Company A gathers

viewpoint

information and learns faster, but so do its competitors.

Current market demands—the need for continuous service and the ability to adapt quickly, to name a few—are giving rise to a new management structure, long theorized, but just now coming into practice. This model builds off a traditional organizational structure, where numerous loosely linked, but separate, groups co-exist. In the emerging model, organizational groups are tightly linked, as in a honeycomb.

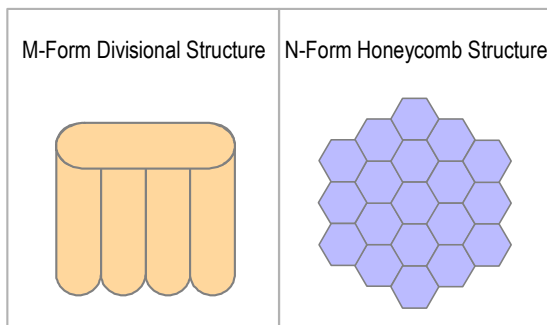


Figure 1: M- and N-form structures have different patterns of relationships and communication paths

In academic parlance, M-form structures are evolving into N-forms. M-form represents specialized divisions and functions that have distinct boundaries—what some refer to as functional silos today. N-form represents a melded network of relationships and functions. Figure 1 above shows the difference between these two structures schematically.

The idea of the networked organization has been around for more than 40 years, so why is it important to think about this just now? The combined forces of the internet, global communication, and advances in information technology make the N-form structure more possible, effective—and necessary—than ever.

Although the power of the internet was over-hyped in the late 1990s, its true value as a tool that transforms the way businesses are run is

starting to become apparent. Peter Drucker, famed for his insights about business, has pointed out that it typically takes 40 years for the implications for a radically new technology to take hold. The effects of the internet are just now taking off in a meaningful way.

The need for new organization structure and management practice is pressing because we stand near the intersection of technological progress and our expectations about what it can deliver. Doctors Stan Williams and Alan Kay, both renowned scientists at Hewlett Packard, point out that there is a mismatch between the exponential progress of technology and our linear expectations for what it can help us achieve. As you can see in Figure 2, this means that we tend to wildly overestimate the potential impact of technology in the short-term, and grossly underestimate its potential in the long-term.

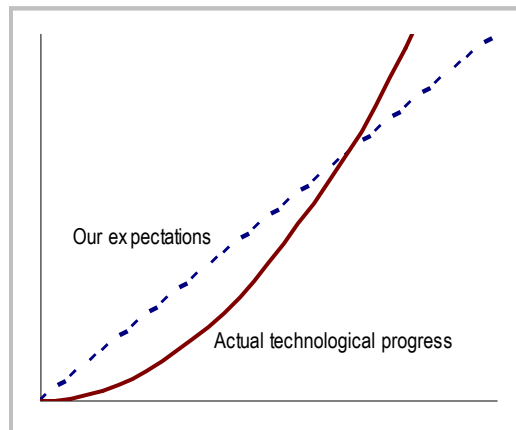


Figure 2: We initially expect more from technology than it delivers, but then it progresses faster than we expect

Case in point: early predictions about the effects of e-commerce were disastrously over-optimistic. No need to retread that still painful ground. Yet, this past 2003 holiday season, online sales were \$18.5 billion, representing about 8.5% of total holiday spending. Online spending was well over one billion dollars more than expectations. Some companies, like the online upscale gift retailer Red Envelope, could

not meet the growth in demand. As Williams and Kay might have predicted, overestimation has been followed by underestimation.

The business leaders who recognize the importance of finally aligning expectations with technology's capabilities are in a better position than most to prepare their companies for the future by evolving toward the N-form organization structure to improve their agility. As outlined below, these firms will be able to make better use of information, and the people throughout the organization will be able to respond rapidly to changes in the marketplace.

Principles of the N-Form Organization

- Information is shared and available throughout the firm
- Leadership and decision-making changes depending on the situation for optimal organization effectiveness
- Skills are constantly evaluated and upgraded
- Emphasis is on establishing trust, relationships, and networks
- Information "tentacles" reach out to customers and into suppliers

The management changes technology requires will grow dramatically, but with this innovation comes new problems. We will discuss in section I the complex role technology plays in evolving organizational structures and the importance of adapting in section II. In section III we will explore the promise of the N-form structure, and finally in section IV, delve into the management challenges it creates.

I. Technology & the Evolving Organization

Technology plays a complex role in helping develop organizational structures, and the N-form structure in particular. On the one hand, technology *directly* influences how efficiently an

organization can be operated because it allows companies to readily change their scale, scope and speed.

At the same time, technology also exerts an *indirect* influence on companies by dictating the pace at which the market evolves. Businesses now spring up, grow, and dissolve at a dizzying clip. This rate of change requires that organizations adapt quickly to new developments. And in today's world, organizations must be highly efficient just to compete.

Scale, Scope, and Speed

Efficiency, a hallmark of organizations with an N-form structure, pays off. Companies that use both the internet and information technology to grow larger and reach more customers (increasing scope and scale)—and do so simply—have prospered.

Citibank, for example—the largest financial services entity in the world, which delivered the biggest profits in corporate history this past year—relies heavily on communications to operate efficiently on a massive scale. In one recent move, Citibank joined "abix," a real-time electronic exchange that enhances communications between banks and their customers. The exchange, which will operate in 90 countries, provides easy access to cash management services and speeds reconciliation processes.

Likewise, Dell Inc.'s business model, with its inventory turns measured in hours, not days, can exist only if there is efficient but extremely low-cost communication across the supply chain, in manufacturing, and in customer service.

Dell operates efficiently at a much larger size than most people thought it could. What's so remarkable is not just that Dell can achieve such scale and scope, it is that it has done so within such a brief timeframe.

A Faster Business Life Cycle

Adaptability, another attribute of the N-form structure, pays dividends, too. As firms begin to learn faster, they adapt to competition faster. But the general environment responds just as quickly to the new developments. We can see this cycle in new product development. The number of new product introductions has more than doubled—to 32,000 in 2001 from 15,000 in 1991—according to the Center of Business Innovation. Product life cycles shorten such that companies can no longer count on new products to deliver profit streams for as long as they once did; witness Coke and Pepsi introducing lemon, vanilla and lime sodas in the past three years.

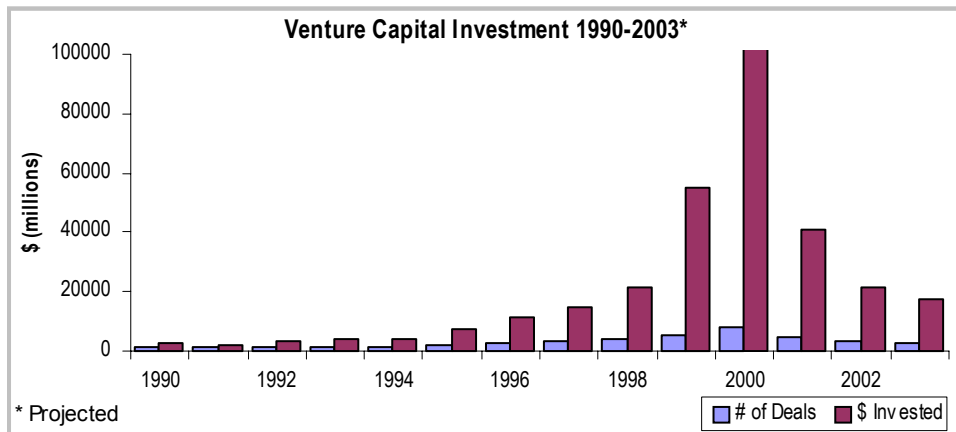
Venture capital that funds new businesses is another barometer of the business life cycle. Even discounting the technology bubble of 1999-2000, investment in new companies is still up, as Figure 3 shows. New companies are created just as fast as they are destroyed, introducing shorter and shorter cycles. Firms must adapt to keep up with the continuing pressure of innovation.

The technology-driven increase in scale, scope, and speed and faster business cycles lays the groundwork for the N-form model. This is analogous to the technological advances that drove the innovation of the M-form model, which we discuss next.

II. History Repeats Itself

Though many analyze the impact of specific technological inventions, investigations of management innovations should not be ignored. Much can be learned from examining how previous organizational structures have sprung up, the benefits they extolled to those that created them, and the conditions that brought those structures to life.

Business historian Alfred Chandler argues that the lasting innovation of companies such as General Motors Corp., DuPont, and Sears, Roebuck & Co. was in their creation of a new management form that allowed them to meet the demands of their environment and carry out their corporate strategies.



Source: National Venture Capital Association, www.nvca.com

Figure 3: Funding of new businesses by venture firms remains higher than a decade ago

New technologies around the turn of the century—the internal combustion engine and telephone, to name a few—laid the foundation for meteoric growth in the economy and the expansion of company size. But this type of growth without structural adjustment, Chandler argues, can lead only to economic inefficiency. Companies must adapt and develop organizational structures that fit environments disrupted by technological advances.

The multi-divisional corporate structure, or M-form organization, which DuPont, GM, and a few others initiated in the 1920s, is a prime example. In it, a small headquarters staff oversees decentralized operating units. This structure made it possible for U.S. companies to expand—some to shocking sizes—and diversify by helping them run efficiently and profitably.

At the turn of the century, DuPont used an organizational structure typical of a large company of the day. Each major function—sales or finance for example—was a separate entity and had its own department and manager, who would oversee that function for the whole company, which, at that time, sold explosives and nothing else.

In the post World War I era, DuPont diversified into chemicals, paints, and varnishes, thereby greatly expanding its scope. Although its products now required radically different marketing and sales techniques, DuPont fit them within its existing functional structure.

And for two years the new products lost money, precipitating a crisis in 1921.

At this point, DuPont reorganized into a multi-divisional structure, giving each product group responsibility for its own profit and loss. The groups handled some functions, such as sales and engineering, on their own, but others, such as legal and R&D, were handled corporately.

The new organizational structure returned DuPont to profitability. Senior executives, previously embroiled in operating decisions,

now had time to create holistic strategic plans. Divisional general managers, who now had ownership over their division's profits, had a psychological investment in bottom-line results. They also had full control over all functional activities and could determine how to use their resources most efficiently.

The N-form organization rises from today's technology explosion as the M-form did before it. For some time, technology has been pushing businesses to become more enmeshed and helping information become ubiquitous and fast moving. Now, these pressures are approaching critical mass, forcing the creation of new management practices to adapt (further specified in section III).

“ Growth without structural adjustment can only lead to economic inefficiency. ”

- Alfred Chandler

The amount of data now available is increasing quickly—and will likely grow faster, if Moore's Law holds true. The axiom, named after Gordon Moore, formerly the chief executive of Intel Corp., holds that the number of transistors we are able to put on an integrated circuit roughly doubles every 18 months. If this exponential process continues for another 20 years, then computer technology will be 10,000 times more capable than it is today.

As long as Moore's Law holds, which respected technology thinkers propose it will, we can expect technology to continue to drop in price and size and increase in speed and power. Information will become only more accessible and pervasive—and these changes will occur faster than we anticipate.

Companies must also learn to compete with increasing numbers of competitors. They're

pitted against organizations of comparable size, as well as larger or smaller entities that might not have been considered threats just 20 years ago. Coase's Law makes this possible. Economist Ronald Coase theorized that transaction costs, the set of inefficiencies associated with firm transactions, determine the size of companies.

Companies form because it is cheaper to organize and maintain an entity that represents a collection of people than it is to have a set of individuals carry out the same transactions in the open market. Companies will expand, Coase theorized, up until the point where the cost of performing one extra transaction internally equals the cost of performing that transaction externally. Thus, if the transaction costs of the market decrease, the smallest of firms have the reach of large companies, and the biggest firms behave as if they have the low costs of small ones.

The online auctioneer eBay is populated by many sellers who are one-person companies. Previously confined to the annual neighborhood garage sale, an individual can create a business with market reach, finding buyers anywhere, cheaply, because his search, information, and other costs are low.

At the same time, if technology decreases the cost of transactions in the market by providing access, immediacy, and transparency to information, then large organizations can become more nimble and grow even larger.

III. The N-Form Organization

With agility at as much of a premium as it is now, the organizational structures that develop must foster this ability. The N-form structure does just that. It breaks the mold of traditional binary management practices—function or product oriented, internal or external—and allows for compromise and duality.

The attributes found below are typical of emerging management practices that the N-form firm aspires to. While these innovations make the N-form organization more agile and competitive, they also give rise to challenges for managers to mitigate. These problems are explored in depth in section IV.

Real-Time Operations

Uses real-time information to make fast changes in response to market conditions.

As database and transactional systems become quicker and more integrated, companies can operate in "real-time." They can feed information to the right person at the right time to make a decision. For example, GE Power Systems helps its customers make immediate decisions about equipment usage. GE embeds smart sensors within its boiler control units that monitor a variety of functions, process information, and trigger alarms if needed. Each device transmits the data real-time to plant operators, who can choose particular boilers or otherwise adjust units to regulate power output, emissions, or fuel usage to suit business needs. Instead of calibrating current settings to historical statistics, operators of GE Power Systems can smooth out inefficiencies caused by lags by making real-time adjustments.

Sensors are just one example of real-time capabilities. While sophisticated technology is a prerequisite for real-time operations of all kinds, its success depends on the structure within which employees make decisions and take action with the information. Built on an increasingly inexpensive network, real-time technologies that automate interactions among employees and workgroups and allow them to collaborate are not far off.

Fluid Boundaries

Breaks down activities to perform some tasks in-house and others outside. Revises operational structure to push functions out or pull them back in as it suits corporate strategy.

With communication and database technology that move customer and corporate data anywhere at lightening speeds, companies can hand over critical functions to be performed by third parties. Secure software allows them to bring the outsiders partially inside, acting almost as part of the firm.

The N-form enterprise continuously evaluates where functions should be handled: outside, inside, or as a mix of both. In March 2002, Dell Inc. outsourced its customer service function to Bangalore, India. Just 21 months later, Dell announced it was rerouting some calls to U.S. service representatives again. Indian customer service operators handle the relatively repetitious and straightforward questions asked by users of Dell's home computers.

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But U.S. representatives field calls from business customers who have complex, unique setups. These calls are often challenging to handle. Dell needs a highly flexible organization to cut up pieces of a particular function and dole just some of them out to far-flung locations.

What's more, decisions about where specific tasks should be handled change over time or vary by specific situation. Organizations must be able to adapt to a variety of possibilities.

Global Reach

Manages the challenges of maintaining a global workforce. Can form flexible organizations, even global ones, without a central authority.

Communications and networking costs have dropped such that even small companies can afford overseas operations—in sales, computer programming, or manufacturing.

Doctors, for example, send in digitally recorded audio files to a small medical transcription service in Austin, Texas and receive a typed transcript of the file in return. What the doctors don't realize is that the company e-mails the files to India to be processed and then merely proofreads the final product in the U.S. As a result, the service's costs are about half those of traditional medical transcription companies.

With activities in almost every country, the World Bank uses virtual networks, which they call thematic groups, to remain connected to changing world priorities. A thematic group connects people who are diverse and dispersed globally but share a passion for a certain topic, such as rural road building, forestry, or indigenous peoples. The groups share information, publish papers, and help each other virtually. Once the technology infrastructure and process rules are in place, these organizations can be formed or disbanded as needed.

Technology gives this type of structure the means to communicate and share work, but management processes are essential to create the culture and skills to make it work.

True Market Pricing

Capitalizes on growing price transparency and purchasing mechanisms (auctions, consortiums) to keep material and overhead costs low.

Consumer and business customers can easily compare prices using eBay, shopping agents, and other tools, so it is harder for markets to hide information. This openness encourages firms to adopt true market pricing.

In the auto industry, for example, consumers can obtain a wealth of information about new and used cars. To attract those consumers who know how much cars sell for at auction but may not be online auction buyers themselves, some used-car dealers in Montreal began advertising cars for sale for their auction price plus \$399. The tactic was so successful that a new car dealer offered the same deal. During this promotion, roughly half the dealer's customers purchased new cars using the flat-fee pricing and half using the traditional verbal haggle system.

Companies must have cohesive management processes in place to handle the effects of market pricing as it is extended deeper into the organization.

Extended Enterprise

Develops business relationships based on high levels of trust and interdependency.

The N-form enterprise cannot exist successfully in a vacuum. It extends into outside firms through alliances and relationships and accepts pieces of external firms within its boundaries.

The ways that firms intertwine vary from outsourcing relationships that cover business processes, such as IT development or customer service, to permeable boundaries between a company and the members of its supply chain.

As data standards become more prevalent, these close relationships become more possible. A laboratory products distributor in the middle of a supply chain, for example, has many opportunities to share information with its suppliers, warehouses, and customers; all hold similar inventory. Boundaries among firms dissolve in an integrated supply chain. The distributor can monitor levels of sold products in its customers' labs and automatically replenish the inventory. Alternatively, the manufacturer's customer service representative can review a supplier's inventory to determine if a direct-shipped item is in stock when a customer requests it.

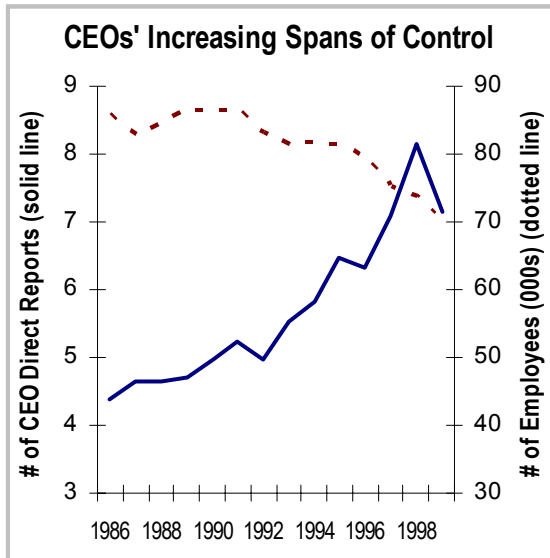
These new types of relationships require the ability to build trust and to manage complex connections.

Centralization and Decentralization

Has elements of both centralized and decentralized organizations simultaneously.

A recent study examined the phenomenon of the "flattening firm," looking at changes in the corporate hierarchy. The study found that spans of control are increasing: the median number of CEO direct reports rose from four to seven over 13 years, as Figure 4 on the next page shows. The graph also shows that the average number of employees in those same firms dropped from 86,000 to 70,000 in the same time frame. These data suggest that CEOs are enhancing their organizations' centralized nature by connecting to more people in the organization while also encouraging decentralization by pushing decision-making deeper into the firm to those who are closest to the end customer.

N-form firms can be both centralized and decentralized at once using technology that allows senior management to see into a large group of employees and businesses, while simultaneously pushing information from the top down, and out to those closest to customers.



Source: Rajan, Raghuram and Julie Wulf, "The Flattening Firm: Evidence from Panel Data on the Changing Nature of Corporate Hierarchies," March 2003. From Knowledge@Wharton, knowledge.wharton.upenn.edu/

Figure 4: In a study of 51 large U.S. firms, the number of CEOs' direct reports is increasing while the average number of employees across the firms is decreasing

IV. Management Challenges

While we can see the N-form organization developing, and even recognize its characteristics in different firms, the structure has not yet wholly manifested itself in a specific firm or organizational structure that we know of.

But firms are moving in that direction. And those that do, face management hurdles.

Those who lead these firms must change the way people typically think, act, and use information in an organization—no small task. Specifically, executives must create the necessary **information infrastructure**, develop new **skills in the workforce**, and foster a **trust-based culture**. They also must adapt their strategy to fit the **type of business** they're running: direct-to-consumer, indirect-to-consumer, or business-to-business.

Above all, the organization must be trained, structured, made culturally ready, and otherwise be prepared for the influx of information and the democratization of decision-making that new technologies can bring. Emerging technologies make information available to almost anyone—especially those at the "edges," the front-line workers that interact with customers, prospects, suppliers, competitors, and partners. The challenge is managing the effects of technology on the firm's employees. The front-line workers are at the center of this information flow into and out of the organization. Giving information to the people at the edge of the organization, where action is taken, removes constraints on decision-making, but it also raises issues of access, skills, trust, efficiency, and risk.

Information Infrastructure

Executives must use technology to allow information to flow seamlessly across, out of, and into, the firm. The information infrastructure developed at an N-form organization, where people and structures can span an entire company, needs to support existing business processes. But it also must accommodate new processes, evolving structures, or new relationships throughout the company.

This type of agility requires that leaders create an infrastructure that allows pieces inside and outside the company to connect in ways that they can't yet anticipate. Strategic enterprise architecture does just that by creating a flexible platform for future technology. A well-planned and executed technical architecture allows information to move freely—from anywhere, to anywhere.

However, the corporate-wide view that information infrastructure requires is one of leaders' biggest challenges in the N-form organization. Executives have to put in place an overarching architecture that works for the entire firm, not just a patchwork of systems

linking individual divisions' separate solutions. Managers must balance the support of existing processes and technology while meeting the infrastructure requirements of the N-form firm.

Workforce Skills

When information is fast moving and people directly tied to customers are empowered to make decisions based on it, context becomes important. Leaders of the N-form enterprise have the challenge of ensuring that front-line workers, in particular, have the skills needed to operate successfully in their newly empowered role. Those employees at the periphery of the organization have no buffer; they constantly interact with people both inside and outside the firm.

The responsibilities, autonomy, and technical and functional skill requirements of employees have increased. Front-line workers, in particular, feel the pinch of this new role—any skill deficits are visible and customer-facing. Rather than following a process or being told what to do, front-line workers increasingly must make decisions proactively using available information.

The leader's challenge is to give these front-line workers the skills, training, and confidence to do so. A retail clerk, for example, is supposed to look at a list of a customer's transactions on her computer screen and determine whether to invite the customer to apply for the regular store charge card or the gold version with no fees. She also has to sell the customer on opening the account. The clerk capable of making the correct credit card decision consistently may be very different from the one who just rings up the sale.

While training helps, it might not be enough. Ensuring that the edge of the organization has the skills needed to operate in the N-form enterprise means making changes in hiring, development—and potentially in involuntary turnover.

Replacing workers instead of retraining them has its own drawbacks, even aside from cost. Unseen in the firm is its social capital—tight, informal relationships among employees. In the N-form enterprise, which functions efficiently in part because of its flexible relationships, social capital is vital. The ability of employees to operate in a networked environment where there may be no clear leader is as important as their “hard skills.”

“ Rather than following a process or being told what to do, front-line workers increasingly must make decisions using available information. ”

The Orpheus Orchestra is renowned for not having a conductor. Instead, after an artistic committee selects a piece, the leaders of each section (e.g., strings, percussion) meet to discuss how the orchestra should play the music. The section leaders, who are different for every piece, then take the music to their sections where the group further discusses, and perhaps changes, how they will play the piece. This type of collaboration relies heavily on the social capital of the organization—the relationships that have built up over time—and the ability of the group to operate in a “leaderless” environment.

Most firms do not have the skill base or mindset in the workforce to handle the sometimes opposing needs of both truly collaborative work as well as the increasing decision-making power of front-line workers. Moving from linear, or hub-and-spoke interactions, to a “honeycomb” network of relationships is more than a structural and technological issue. The

challenge to N-form managers is to instill the soft skills and culture to make knowledge-based work and decision-making on the front lines a success.

Trust-based Culture

Moving information to the edges of the organization in the N-form enterprise can also change the dynamics of the relationship among employees and between employees and the company. Empowering front-line employees with information takes away the traditional information monopoly from middle managers, diminishing their personal and organizational power. Technology forces companies to relinquish some of the control a traditional structure provides and puts it in the hands of its workforce. Creating trust in such an organization is one of management's biggest challenges.

While departing from a traditional management structure is an adjustment for some companies, it is a grand leap for military organizations. Nevertheless, the information age infrastructure allows the military, like the private sector, to become a more "self-synchronizing" organization, in which front-line "employees" have virtual autonomy in deciding how best to carry out a directive from the theater command.

In their book on network-centric warfare, David Alberts and Richard Hayes, writing for the Department of Defense Command and Control Research Program, describe trust as one of the four tenets of self-synchronizing military forces. For this kind of philosophy to work, subordinate personnel must have a clear understanding of command intent, high-quality information, competence at all levels, and trust in the information, people, and equipment involved. High-level commanders must trust that subordinates will understand and enact their intent using the resources provided, and subordinates must trust that the information and resources are available when needed. Trust is

not easily attained, particularly when a coalition of mixed nationalities is acting in a region. It must grow from joint training, missions, and multi-lateral exercises—in other words, through continued interaction and reinforcement for which there is no technological substitute.

Private enterprises face an even greater challenge than the military in establishing a trust-based culture because they do not have total control over their employees' location, training, length of employment, and living arrangements. Culture moves slowly; it always lags every other kind of change. People's actions are learned, their responses conditioned. Also, the relationship between people, information, and companies is a fluid and complex one. People create identity and have influence through the information that they control. Moving information in new networks in the N-form organization and giving decision-making power to those on the front lines, demands a new level of trust between leaders and their employees.

As a substitute for trust, some companies turn to monitoring employees to ensure they are carrying out management's intent. New technology makes monitoring easy—call center software tracks exactly when customer service representatives are on the phone, global positioning sensors relay truckers' location coordinates—but it can be a trap. Monitoring can undermine the agility of the N-form firm by engendering suspicion and consequently mistrust, even antagonism, among employees. Ultimately, trust is a more effective and sustainable means of organizational agility—but it takes longer to build.

Business Type

All companies face the management challenges of creating the information infrastructure, skill base, and trust necessary to support the N-form organization, but additional challenges materialize depending on the business model. Information and management requirements differ based on whether a company is direct-to-consumer, indirect-to-consumer, or industrial.

With **direct-to-consumer** businesses, the challenge is often balance. These firms walk a fine line between making customers happy and keeping costs down. Customers expect these firms to be available 24x7. They also want high levels of service, immediate responses, lots of choices, and low prices. All of which require investment in technology and information infrastructure—which costs money.

For many **indirect-to-consumer** companies, the concern is developing and maintaining a strong bond with customers even though the relationship is handled by middlemen. To keep customers satisfied, these companies must communicate with their sales channels so seamlessly that they act as one entity—not two or more. They must gather data from the channel, process it, and distribute it back again—real-time. They must also work productively with their sales channels by building trust, providing incentives, and making sure the firms' interests and their partners' interests jibe.

For companies in the **industrial** or **business-to-business** sectors, standards are key. These firms must often create a common language that binds different entities despite what may be diverse cultures, sizes, and operational types. They must put in place methods, rules, and/or technological infrastructure that make such things as communications, money transfers, and information exchange flow smoothly.

Conclusion

The N-form organizational structure is beginning to take hold. It is the next incarnation of the multi-divisional corporation and the grandchild of the joint-stock company. Achieving the capabilities of the N-form enterprise requires a bold vision and highly integrated technology and management plan.

Leaders must change infrastructure, organization, and management processes—the very culture of the company—which often must occur in spurts over time.

Communication and information technology in and around firms historically has spawned management innovation. Technology changes the scale and scope at which firms operate and increases the speed with which they take in information from their environment, turn it around, and push it back out. The old organizational structures don't provide the agility needed in the modern environment. Technology supports the creation of new management practices, using the N-form model, to remain profitable despite volatility, and to adapt as technology's capabilities exceed our expectations.