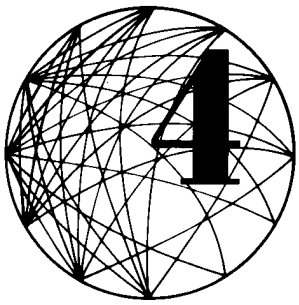


In It Together: Crossing Boundaries in Groups

On the ground floor of the British Museum of Natural History in London, a small sign that incites critics of genderized language points upstairs to an exhibit called "Evolution of Man." Here, in a few moments, visitors can trace the history of our species, through physiology, anthropology, and even a few shards of archaeology. What the exhibit makes clear is that, regardless of how we prefer to view ourselves, people are herd animals.

From the dawn of time, life has lived in groups: colonies of invertebrates, societies of bees, and troops of bonobos. Increasingly complex social forms of life have evolved alongside increasingly complex individual forms. As humanity evolves, so do our groups.

"Working in groups" is one of our foundation skills. Whether we are good or bad at it, we all participate—no matter how towering the edifices of the globe-girdling organizations that we occupy. In business, real work always gets done in a small group of people.

The fundamental relationship in business is a transaction between buyer and seller. It generates a temporary team laced with the

tension of cooperation and competition. Both buyer and seller compete for the "best price." Making a deal requires that each cooperates in a mutually beneficial exchange.

David and Goliath Have Common Interests

Big and small companies have a lot to learn from each other, which is why many already have teamnets among them. Big companies have expertise in technology and planning methods; small companies hold clues for entrepreneurialism and alliances.

Big companies are downsizing toward core competencies and outsourcing many peripheral parts and functions. This creates more opportunities for small companies, *and* it puts greater pressure for quality, state-of-the-art technology, and cost containment of the overall product or service in many small hands.

Small business networks located upstream and downstream in the value chain can recover some of the good jobs that big business eliminates when it slims down. Indeed, a more flexible disaggregated big-and-small business structure may net more jobs overall.

As business people, we want our companies to run lean and do more with fewer people. As citizens, we want a vibrant economy constantly creating many good jobs. To accomplish both goals, more, smaller companies must move quickly and flexibly to meet niche needs that fit into a larger competitive mosaic.

Lessons also transfer across the Thamnet Scale—small group, large organization, enterprise, alliance, and economic megagroup— from internal to external endeavors. High performance at more inclusive levels, like the enterprise and alliance, requires high performance at the small group and organization levels. Strategists cannot concoct brilliant enterprise-level teamnets without knowledge of how small teams work and what motivates people.

Historically, businesses began as small groups. Small businesses are still a major part of the economy. Naturally, new businesses start small; a few grow larger. As they grow, they make internal

divisions so that work still gets done in small clumps of people. Work clumps on the shop floor and the mail room, and it clumps in small groups all the way up the chain of command. Supervisors meet with a manager, who is on the staff of a general manager, who is on the staff of a VP, who meets every Wednesday morning with the small group in the executive suite. Small groups permeate organizations of all sizes at all levels.

Small groups must adapt to accelerating change just like all other organizations. The training ground for boundary crossing on larger scales is how we manage our affairs in our own small groups. Boundary crossing teamnets begin at home.

When two multinationals negotiate an alliance, they usually begin with a meeting of a few top people from each side who know each other. They "agree to agree" if things can be worked out. Small cross-functional teams from each side work out details, then other small teams work on the projects. On paper, it is a relationship between enterprises; practically, it is a process of many small boundary crossing teamnets forming and reforming.

Small groups are good places to learn basic boundary crossing skills. They are also wonderful laboratories to experiment in new forms of competition/cooperation relationships.

In this and the next chapter, large companies are the focus, comprising many internal levels and many external relationships. In the two chapters following these, small companies are the focus, moving from the small group to the economic megagroup scale.

Teamnets do not have to be big to have great leverage. They need only be strategically situated. Conrail's story shows how.

This Is a Way to Run a Railroad

Railroads symbolize the Industrial Revolution, chugging along, moving raw materials from their source to refineries to manufacturers to distributors and eventually to customers. By the mid-1970s, trucks, highways, aircraft, and high-speed telecommunications

completely eroded the monopoly railroads once held over transportation. In 1976, Conrail emerges when it resurrects one of the country's premier rail lines, the Penn Central, from bankruptcy (along with a handful of assorted smaller lines). Unfortunately, the newly organized freight transportation company is the epitome of the rigid industrial age hierarchy, burdened with bloated bureaucracy. In the next 13 years, Conrail shrinks its work force by an astonishing 70 percent—from 100,000 to 28,000. Eliminating people, however, does not solve Conrail's problems.'

In May 1989, James Hagen comes aboard a still-struggling Conrail. To turn the company to profitability, Hagen forms two networks from the 450 top managers.

"There are no more than 25 people in this company whose close horizontal collaboration will have a dramatic impact on the bottom line," he says. "There are the seven assistant vice presidents in the marketing department responsible for our lines of business—steel, autos, intermodal. six general managers responsible for railroad operations... some key people at headquarters—the chief mechanical officer, the chief engineer, the head of customer service—as well as the senior management group. On their own, none of these managers can move the business decisively. As a network, they [can]."

The 13-member senior planning team comprises 11 people from top management and two from middle management. Hagen selects the "Strategy Management Group" (SMG) as "the smallest working group whose interlinking can significantly affect both the operation and selling of our basic services.

The SMG soon forms "subnetworks" to tackle key problem areas. One subnetwork's story shows some of the real life drama generated by co-opetition—the combination of cooperation and competition. Its Customer Service Subnetwork (CSS) undertakes to solve Conrail's longtime customer service problems.

Customer service is spread out in three separate departments and 10 locations. Previous attempts to improve service and cut costs have gone down in "painful and demoralizing" turf battles. However, the six middle manager stakeholders—from customer service,

information systems, regional station management, labor relations, corporate finance, and general station management—face the disturbing reality that few want to admit. To do the right thing by the company means consolidation, which will cost two members their positions. They make the hard decisions.

As the CSS pulls together its recommendations for the whole SMG, some senior managers make it clear that they oppose any consolidation proposal. CSS declares it will dissolve rather than put forward an unworkable proposal. No way, says the SMG, recommending that CSS take its proposal to Hagen's other boundary crossing group, the Senior Planning Team. In short order, the six middle managers find themselves presenting their case to Conrail's top management—and winning!

In late 1990, a seemingly routine public announcement—that Conrail will consolidate customer service operations in Pittsburgh—goes unnoticed. Internally, however, the announcement signals a massive change in the way Conrail makes decisions. In particular, the SMG, virtually unknown to the public, is smiling, for this is their triumph. It is a common corporate vignette, but in the life of Conrail, it is a rite of passage. Its new boundary crossing teamnets have come of age, bringing into effect corporate strategy and making decisions that stick. In just 18 months, they are able to do what the bureaucracy could not accomplish in 15 years.

As the new year begins, Conrail's operating committee, a 19-member subset of the SMG, takes formal responsibility as the railroad's "core network for profitability." Members meet for two hours every Monday morning to make key tactical decisions around price, schedule, and service consistency. Senior management joins in discussions and receives reports, but does not chair or dominate the proceedings. The boundary crossing teamnet generates a five-year plan for the first time in the company's history, to provide a clear context for their daily decisions.

Conrail is an example of how small teamnets can be very effective in even the most traditional organizations. What happens when the teamnet idea shapes a whole company? One fascinating case is the company known for its water-repellent fabric that "breathes."

Meet the Lattice: The FreemForm Organization That Makes Gore-Tex

Gore-Tex ™ is a miracle weave in the fabric of the world's outdoor life. It evaporates sweat while protecting its wearer from the drench of rain. Gore-Tex is a visible, distinctive partner with producers of ski gloves, tents, and clothing of all descriptions. Like Dolby'™ sound, Gore-Tex is known for the special contribution it makes to a wide range of products.

If ever there were a company whose product mirrored its culture, it is W L. Gore & Associates. This lattice textile is made by a *lattice organization*, a company designed for horizontal interactions where employees are known as "associates."

In 1982, *Inc.* magazine runs a cover story on the Newark, Delaware, company best known for its popular product Gore-Tex. Headlined "The Un-manager: Without Ranks and Titles," the story describes Bill Gore's "not your average" almost-billion-dollar company. By 1991, the company is among the "400 largest private U.S. Companies."[2]

The name "W. L. Gore & Associates" captures the essence of this remarkable enterprise. The design of the company is that of a network. Its core glue is the philosophy of its husband-and-wife founders, Wilbert ("Bill"), who died in 1986, and Genevieve, who remains involved in the company. *Business Week* features their son Robert in 1990 in an article titled "No Bosses. And Even Leaders Can't Give Orders."[3]

The 1982 *Inc.* story so excites us that we call its author, Lucien Rhodes, who in turn forwards us a poorly typed document with a few handwritten notes on it that Bill Gore has sent him. "The Lattice Organization—A Philosophy of Enterprise" describes the Gore "bureaucracy":

People group around projects undertaken on the basis of commitment.

The firm's 5,600 *associates* (not employees)—now in 46 plants in six countries—have *sponsors* (not bosses), who serve as their mentors and advocates.

Gore's projects are boundary crossing teams. "The mathematician, engineer, accountant, machinist, chemist and so on provide a combination of capabilities of a much broader scope than the mere sum of their number. This synergism ... impels us to join together for mutual benefit."

STUMP SPEECH TO THE TRIBES

Bill Gore's paper, written in 1976, was the basis for many talks that he gave over the years to the company's associates.[4] (Which brings us back to the name: *everyone* who works at W. L. Gore & Associates is an associate.)

It's not your typical corporate speech. With his ponderous, sometimes mystical tone, Gore sounds more like a 19th-century transcendentalist than the late-2Oth-century entrepreneur that he is. He begins with the "Nature of Man," the starting point, usually unstated, of every corporate culture.[5] One part of our heritage, he says, comes from hunters and predators with the urge to attack, destroy, loot, vanquish, and overcome competitors. Fortunately, humans evolved new social capabilities that carried the species far beyond this endowment. 'A further great evolutionary invention is the cooperation of groups made possible by friendship and love.... The tribal group ... combines aggressive capability welded together by emotional interactions." To Gore, the essence of human nature is co-opetition.

Besides being capable of friendship and love, he says, people are also dreamers. He asks what would happen if people doubled their

brain capacity. “If the norm in our society is the utilization of say 10% of our inherent human capabilities, what would be the result if we were able to restructure … this to double to 20%?”

People participate in groups because together they can accomplish more than alone, he says. Gore believes accomplishment peaks with about 150 people in the same group. After that, results decline, and it’s time to form another group, a principle that the company puts into practice. Gore breaks plants apart when they exceed 150 to 200 people. This is, roughly, a tribal size, the upper-limit size of groups that people lived in after the invention of language but before the development of agriculture and cities.

When groups pass out of the realm in which everyone knows everyone else, Gore believes “we" quickly translates into “they.” This tiny language signal announces the beginning of turf wars, the identification of enemies, and win-lose maneuvers that eventually bring down even great companies.

THE LATTICE BEHIND THE FACADE

There’s another downside to groups of more than 150 to 200, Gore says. “Beyond some such level, it becomes necessary to impose rules, regulations, procedures and the like that dictate how the cooperation shall be done. Special teams evolve within the lattice structure usually led by someone particularly competent in the discipline or activity of the team. One individual may participate on several such teams and have a leadership role in them. These multi-participant people serve an important liaison function and are often involved ina number of different teams,” Gore says.

To avoid bureaucracy and to reach for that doubling of human capabilities, the company uses the lattice, which has these characteristics:

? No fixed or assigned authority;
? Sponsors, not bosses;
? Natural leadership defined by followership;

? Person-to-person communication;
? Objectives set by those who must make them happen; and
? Tasks and functions organized through commitments.

Leadership "evolves" at the company, according to Daniel D. Johnson, who eventually followed in his former co-worker's footsteps, leaving Du Pont to join Gore. "You look behind you, and you've got people following you."

In Gore's view, "Every [successful] organization has a lattice organization that underlies the facade of authoritarian hierarchy. It is through these lattice organizations that things get done. Most of us delight in 'going around' the formal procedures and doing things the straightforward and easy way. The legendary subversion of official military procedures by the 'non-coins' is an example of this. All astute military leaders utilize this *sub rosa* lattice."

For all his unusual ideas, Gore is not a romantic. He doesn't propose replacing every aspect of hierarchy with lattices because of what he calls obvious difficulties:

? "Stability and long-term constancy require a firm hand at the helm;
? "Decisions must be made. Complete consensus is never achieved;
? "There seems to be some upper limit for which the lattice is effective; and,
? "It's unrealistic for people to set their own salaries."

VOW TO AVOID BUREAUCRACY

"The rest of Corporate America is only beginning to think about how to motivate employees now that there's a shrinking hierarchy to slot people into," Joseph Weber says in the 1990 *Business Week* article. "But Gore, a quirky, family-held plastics company, has never had much of one: It has been experimenting with an almost free-form management structure for 32 years.... Gore isn't some little

countercultural outfit, mind you. By turning a flexible form of Du Pont's Teflon into Gore-Tex, used in fabrics and assorted medical, electronic, and industrial products, the company has grown into a nearly $700 million a year outfit, whose return on assets and equity puts it in the top 5%, whose sales quintupled in 8 years."

As irony would have it, of course, Gore started his own company because "as a Du Pont chemist, he couldn't get his innovation— Teflon coating for electrical wires— marketed by the big company. When he left, he vowed to avoid stifling bureaucracies, so he tossed out the traditional chain of command for a 'lattice' system. In it, any staffer may take an idea or complaint to any other: A machine operator can talk directly with plant leaders."

In his lattice organization paper, Gore gives Du Pont credit for inspiring his "ahead of the time" ideas. "The concept of the lattice originated from my consideration of the operation of 'Task Forces' created during the 1950s to carry out research and development within the Du Pont Company. The original ideas have been refined and extended over the past 18 years. The record supports the belief that a lattice organization releases and promotes the creativity of human beings."

Task forces at Du Pont and lattices at Gore are just two expressions of the worldwide, simultaneous, uncoordinated "experiment" with boundary crossing teamnets in the past few decades.

A Teamnet for Every Occasion

THE TEAM AS HERO

In business, people form groups to do work and accomplish goals together. That is the genius of the firm. How people organize themselves to do work gives them their organizational advantage or disadvantage, as the case may be. To see the world of groups, you must be able to shift your focus from individuals to groups of

people—*without losing the individual perspective!* It's much harder than it sounds.

"If we are to compete effectively in today's world, we must begin to celebrate collective endeavors in which the whole of the effort is greater than the sum of individual contributions. We need to honor our teams more, our aggressive leaders and maverick geniuses less," writes Clinton administration Secretary of Labor Robert Reich, in his 1987 *Harvard Business Review* article, "Entrepreneurship Reconsidered: The Team as Hero," famous in team circles.[6]

That Lee Iacocca is reputed to have saved Chrysler obscures the larger network of Chrysler, labor, government, and other major contributors to the rescue and recovery. If the hero gets single-handed credit for saving a horrendously complex and risky situation, the actual group and countless commitments that really made the success are ignored.

"[E]conomic success comes through the talent, energy, and commitment of a team—through *collective* entrepreneurship," Reich says in his article, pointing to the American blind spot created by the ideology of individualism. He uses Tracy Kidder's *Soul of a New Machine*[7] as an example of a team-as-hero, "a tale of how a team—a crew—of hardworking inventors built a computer by pooling their efforts."

Reich has a grave warning if we ignore teams. "To the extent that we continue to celebrate the traditional myth of the entrepreneurial hero, we will slow the progress of change and adaptation that is essential to our economic success."

A team is different from a group; a team adds value. A group associates people by anything, whether deeply like a family or superficially like a group of mostly random passengers on Flight
108. A team is more than individuals; it has synergy. It has an organizational advantage.

Reich calls for new team-as-hero myths, and they're already being written. Dean Tjosvold and Mary Tjosvold open their book, *Leading the Team Organization: How to Create an Enduring Competitive Advantage*[8] with such a vision:

> You are part of **a** team committed to a common cause in which you help and are helped to be as effective and fulfilled as possible. You can get close to your colleagues and depend upon each other for support, encouragement, and information. You and employees form project teams to combine expertise and join task forces to explore problems and conflicts and to implement solutions that further mutual benefit. You feel united and loyal to your team and company.

Real life, of course, unfolds a bit more rockily than this, so the Tjosvolds contrast this idyllic picture with scenarios of "competitive outdoing" and "independent work."

Teamnets are networks of teams.

Teams may have widely varying internal styles, yet form into larger teamnet groups. Hierarchies often form coalitions, alliances, and even networks to emphasize their autonomous nature. Whether a command-and-control firefighting team or partners in a professional firm, teams allow people to do more together than they can accomplish alone.

Teams also carry the implication of smallness, as a particularly coherent form of small group. Teams are the level where it gets real personal.

BOUNDARIES: GET A **GRIP** ON A POINT **OF REFERENCE**

Without boundaries, there is nothing: no distinctions, differences, or diversity to make up complex things. Teamnets need boundaries to work, to be logical. Some boundaries are easy to see, such as a person who has a unique name, personality, and face; legal corporations, which require that you wear a badge while within their borders; and nations, to which you present papers before entering.

Borders provide "hard" boundaries. They are visible and typically exclusive—either you are in or out. Membership is clear.

Business teamnet boundaries are either sharp or *fuzzy*. As in traditional hierarchy-bureaucracy, teamnets can use sharp boundaries, borders that create a need for free trade agreements and membership fees. Teamnets also have fuzzy boundaries, which sometimes arise from particularly porous borders created by great "gray" areas of employees, part-timers, flex-timers, contract workers, consultants, colleagues, and, yes, suppliers and customers. Sometimes they are fuzzy because a central idea, person, or group with concentric circles of increasingly less involved peripheral relationships defines the teamnet.

TEAMNETS ACROSS **THE LEVELS**

Teamnets apply across the organizational range: from small groups of only a few, to larger organizations, to enterprises as a whole, to alliances, which are groups of enterprises, to economic megagroups, which cross industry, corporate, political, and geographic boundaries.

Small groups often have quite informal boundaries. Large internal organizations tend to have more formal boundaries, but less so than a corporation. External alliances—with the exception of joint ventures—tend to have less formal boundaries than enterprises. Economic megagroups mix many formal and informal relationships.

> *The personal challenge is to cross*
> *boundaries no matter what the level or size.*

Each of the five levels—from small group to economic megagroup— represents a general organizational type. Everyone in business belongs to one and usually more of these types. In the Teamnet

Organization Scale chart, examples of teamnet forms at each level appear on the right. These are not the only examples, but each contributes a different message about the emerging nature of team-nets.

Small Group

The size of a small group starts with two and can be as big as a few handfuls. With more than 20 or so people, you are pushing the limits. “The rule of seven,” give or take a few, provides a good average size. In teamnet terms, this is the team level.

? *Empowered teams* emphasize the quality of independence.
? *Study circles* demonstrate the self-help power of peers.
? *Top teams* show that teamwork works at every level.

Large Organization

Beyond the small group size, there is another typical cluster around 40 to 50 people. This seems to be some natural size for an administratively self-sufficient business unit. A further clumping happens at around 150 to 200 people, the average size of ABB companies and Gore factories, which seems to be a typical size in many industries for a fully functional, cost-effective, autonomous business division. The teamnet concept, rooted in small groups, expands into larger organizational frameworks.

For teamnets, the large organization level represents middle management. It encompasses clusters of 50, business units of 200, and other major internal departmental and/or divisional boundaries.

? *Cross-functional teams* underscore cross-enterprise needs and processes.
? *Empowered clusters* have administrative self-reliance and other bottom line responsibilities.
? *Sociotechnical systems* make the critical point of fit between technology—particularly information and communications technology—and organizational structure.

Enterprise

To understand teamnets in their full scope, you must travel the levels in your imagination. But it is easy to get confused without a firm point of reference in a complex situation involving many levels. Our advice: Set yourself up at the enterprise level and use it as a base camp for exploring multilevel teamnets. Clarity is greatest in the middle of the scale; fuzziness is greatest at the extremes.

Level does not mean size. Adjust your teamnet scale to a typical enterprise size in your context.

An enterprise, which we're defining as an "incorporated legal body," can be as small as one and theoretically as large as humanity as a whole. China alone incorporates a quarter of the world's people. The teamnet factor applies to huge macro-enterprises and tiny micro-enterprises, and everything in between.

- *Kaizen* shows the value of continuous improvement applied to the whole company.
- *Internal markets* replace many internal controls with the discipline of external markets.
- *Service webs* are distributed and entrepreneurial.
- *Core firms* illustrate how outsourcing can become networking.

Alliance

Alliances are notable for their incredible variety but generally small numbers of partners. This is the small group level of enterprises. Bilateral alliances are most common. Groups of "a few" companies make up most of the rest. Some alliances, of course, involve hundreds or thousands of enterprises. As numbers increase, either the meaning of partnership becomes severely diluted, or the alliance tends to become an organized megagroup.

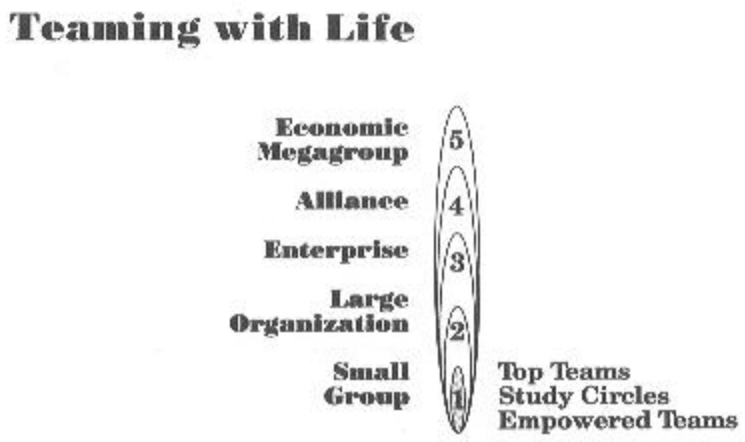
- *Joint ventures* create a new business that quite literally represents the "something more" synergy of an alliance.
- *Strategic alliances* underscore interenterprise needs and processes, like external cross-functional teams.
- *Flexible business networks* leverage the advantages of scale while retaining the power of small.

Economic Megagroups

Economic megagroups are very big agglomerations of teamnets of every size and point on the scale. They represent the economic power available to those that learn the art of cooperating and competing on a very large scale, focused on a geographic region, an industry, or a funding source.

- *Keiretsu* illustrate the family approach to multitiered business alliances.
- *Voluntary geographies* capture the value of whole regions and industries of alliance ferment.
- *SME economic development* shows how public-private efforts can catalyze large numbers of flexible business networks with a great impact on the macro-economic bottom line of nations.

Next, we will look at the first two levels of the Teamnet Scale: small groups and large organizations. In the following chapter, we look at the next three levels: enterprise, alliance, and economic megagroup levels.



Teams are stretching the limits of what small groups can do together. People at every level need to work in teams, and can improve performance by using the teamnet organizational advantage.

Small group teamnets have many labels. *Empowered teams* tackle manageable chunks of work and take shared responsibility for results. *Study circles* are simple, voluntary peer-based associations to solve problems and improve processes. *Top teams* remind us that all levels of organization are inclusive, with smaller forms continuing into larger forms.

P&G PIONEERS IN GROUPS, NOT JUST SOAP

What makes a teamnet different from a committee? It is empowered in some substantial way by its empowered members. Otherwise, neither the group nor the members would meet the teamnet criteria of independence. "Empowered" is the difference between a team that fixes a problem and a committee that recommends options.

"Empowered" can be very narrowly defined in terms of specific problems and opportunities. It can extend to mean an autonomous group or self-directed work team: groups of from 5 to 20 multiskilled and often highly trained employees responsible for turning out a well-defined product or service. The self-directed idea implies that members work together, planning, controlling, and improving their work.[9]

> *For Americans, today's team issue is empowerment. The dream of being your own boss in a big company comes close to being realized in autonomous teams.*

In the mid-1960s, Procter & Gamble (P&G) begins to explore what they will later call "high-commitment team systems." After three decades, P&G still promotes these teams, reporting productivity

improvements of 30 percent to 40 percent in the 18 plants using them. Until recently, P&G considered these teams such a competitive advantage that they provided little public information about them.

"The reason I am enthusiastic about self-directed teams is simple:
they really do work," says David Hanna, P&G's manager of organizational development. "In fact, if they are designed properly and nurtured well, they almost always outperform other organizational forms. I say this, having been a line manager myself who once wandered in the dark on this issue, not knowing what the outcome might bring."

In the mid-1970s, other American experimenters with self-directed work teams are Cummins Engine and General Motors. In the 1980s, a slew of companies including Ford, Digital Equipment, Tektronix, General Electric, LTV Steel, Boeing, and Caterpillar follow suit. In most cases, the idea shows up in isolated experiments, albeit ones that generally involve whole plants, such as Digital's Enfield facility in Connecticut. Unfortunately, none of these companies has yet been able to take the step from experiment to policy.

Self-directed work teams have not taken off from lack of success. Rather, the enormous blinders of skepticism hold them back.'[0] It often comes down to issues of trust: will people work without supervision? It also comes down to issues of power, and middle management is generally more threatened than senior management.

HOW "MADE IN JAPAN" CAME TO MEAN **QUALITY**

While the Gores and Percy Barnevik have applied the teaming idea to whole companies, the Japanese have applied teamnets to a whole *country*. One widely known type of small group, the quality circle, is the child of the 1960s, Japanese-style.

The work of American W. Edwards Deming catalyzed Japan's overall quality movement. Deming's statistical control techniques, his people-based philosophy of business, and his visits to Japan

beginning in 1950 crystallized a focus that grew into a management practice cooperatively developed throughout a whole country.

The Japanese did not invent small teamnets in business, nor are they the source of all the current array of organizational innovations. But Japanese success in the 1970s and 1980s drew new attention to the nitty-gritty small group details of business. Many of the buzzwords of the 1980s are standard operating procedure in the 1990s. Cross-functional teams, for example, are now in the repertoire of every modern manager. Few American companies, however, have a truly *cross-function* organization throughout the enterprise, such as Toyota has perfected.

Quality circles were born with the 1962 publication of *Quality Control for Foremen*, a magazine started by the Japan Union of Scientists and Engineers 12 years after Deming's first visit to the group. With so much new information about the then-nascent quality movement available in one place, groups of supervisors and workers spontaneously spring up all over Japan to study it. These study groups soon become known as *quality control circles.* Their common purpose is to change the 1950s perception that "Made in Japan" means cheap and shoddy.

Quality circles" are part of a larger enterprisewide quality management strategy that also puts emphasis on individual self-development. They are self-empowered, peer-based groups of limited scope with intense local focus on shared work.

Komatsu, the Japanese heavy equipment manufacturer, begins its odyssey with quality circles in 1963 in response to a crisis sparked by its major competitor. Caterpillar, the American giant then 10 times Komatsu's size, signs a joint production agreement with Mitsubishi Heavy Industries in 1961. In response, hundreds of quality circles form all across Komatsu. In 1992, Komatsu is a formidable competitor to the ailing Caterpillar with comparable revenues and net worth. Quality circles are still integral to the company's culture, with astonishingly high participation rates in these voluntary, informal organizations: 95 percent of all manufacturing groups and 89 percent of all sales and service groups participate.

For the Japanese, quality circles are simply the application of good sense to manufacturing processes. That is, the people most knowledgeable and responsible for a local process solve problems together as a small group. Over the years, quality circles have spread like a positive virus from the factory floor to other parts of the organization—to administration, sales, and service functions.

Quality circles merely are the most famous of Japans many small group industry efforts: no-error movements, level-up movements, big-brother groups, big-sister groups, ZD movements, mini-think tanks, suggestion groups, safety groups, workshop involvement movements, productivity committees, management-by-objectives groups, and workshop talk groups. Regardless of what they are called, they have changed the meaning of "Made in Japan." Today, it equates with quality.

Study groups for practical action are a Japanese invention, as imbued in the country's culture as self-help groups are in the United States. While the attempt to directly transplant quality circles to the United States has not been all that successful, the United States does have an analogous cultural norm.

Small, voluntary groups dedicated to some highly localized purpose, whether in the workplace, neighborhood, or community, are very common in America. These valuable informal self-help networks just haven't been given a sexy name and much attention as a real, improvable form of organization.'[2]

THE EXECUTIVE WASHROOM TEAM

The executive team is a notion that stretches the Western presumption that all hierarchies come to a point in one person.

The pressure toward more flexible, horizontal organizations— subtle but unrelenting—reaches into the executive suite, the very heart of the temple of hierarchy. At the pinnacle of corporate decision making is the ultimate cross-functional team: the top team. The

question is: Are the people at the top a team or are they just a command-and-control system operating from on high?

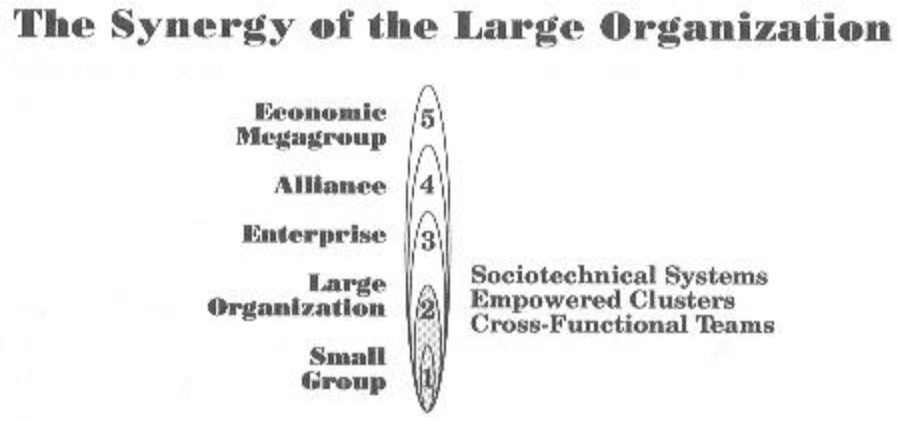
In the West, people tend to believe true leadership points up to a single person. Traditionally, each Western hierarchy comes to a single, sharp point. Our deep cultural models are Egyptian pharaohs, Roman emperors, European kings, Catholic popes, American presidents, and CEOs, each one at a time, thank you.

The Japanese, however, with an ancient culture of a weak emperor and strong councils of local shoguns, typically have a *blunt* hierarchy, a small group of essentially peer decision makers at the top.

While many know about such celebrated instances of multiple top leadership as the Intel triad, including president Andrew Grove, few are aware how dramatic a trend there is toward teaming at the top in the United States. In the 20 years from 1964 to 1984, American executive team arrangements in large companies tripled from 8 percent to 25 percent.'[3]

In the 1960s, the typical American company had a chief operating officer (COO) reporting to a chief executive officer (CEO), often also serving as chairman of the board. The heads of vertical functional and divisional line organizations reported to the COO. In the 1980s, a new form emerges: an executive team reporting to the CEO replaces the COO position. An executive team is "a group of people who collectively take on the role of providing strategic, operational, and institutional leadership for the organization. Each member is responsible for her or his own unit but also wears another 'hat,' that of corporate leadership," write David Nadler and Deborah Ancona.'[4]

Corning, Inc.'s management committee, set up by CEO James Houghton, is an excellent example of a top team, which is so clearly beneficial in companies with complex and diverse businesses. ABB's 13-member executive committee headed by Percy Barnevik has the same mix of collective responsibility *and* strong central leadership.



The small group is the first level at which teamnets occur; the large organization is the second. Here we see teamnets taking forms like cross-functional teams, cluster organizations, and high-performance work systems. Large organizations range in size from Conrail's Strategic Management Group with its 40 to 50 people (the typical size for an administratively self-sufficient business unit) to 200, the average size of Gore's factories and Asea Brown Boveri's companies (a typical size for a fully functional, cost-effective, autonomous business unit), to even larger departments and divisions.

In response to a crisis that clearly cuts across departments, companies pull together small groups of people into special-purpose teams that have a clear short-term mission. *Cross-functional teams* are a popular form of temporary group in big companies.

In response to the pace of change in the electronics industry in the 1960s and '70s, high-tech companies like TRW and Digital Equipment extend the cross-functional concept to semi-permanent projects and programs. These multilevel groups often control a significant budget and head count.

Empowered clusters emphasize the administrative independence that is a hallmark of teamnets at this level. High-performance work

groups, *sociotechnical systems*, exist in all different sizes, with very varying life spans, and radically varied access to resources. They can refer to a small high-value team or to an entire manufacturing facility, or even to a company as a whole.

TOYOTA'S QUALITY INVENTION: CROSS-FUNCTIONS

While cross-functional teams may be small groups, members often represent other groups who may be involved at some level. An engineer on a project negotiates resources and reviews progress with managers and other engineers attached to the function. A fully articulated cross-functional teamnet operates as a network of functional teams.

One $14 billion company hastily organizes a cross-functional team when it sees its biannual trade show fast approaching. Unfortunately, it has five competing internal groups, who, unless deterred, are about to present a horrifying picture of confusion to their customers. The cross-functional group buckles down to work, by everyone temporarily "throwing away"[5] his or her organizational affiliations and committing to work for the company as a whole. Within three weeks, a group of 60 people, represented by a core group of 15, presents its findings to seven of the company's top vice presidents: a plan to unify the competing products within 18 months and a common set of clear customer messages. For this cross-functional team, the trade show was a success as well as the end of the line for its work.

In the United States, horizontal coordination among cross-functional teams is typically a quick fix. Some companies are so entrenched in their ways that their functions take precedence over everything else. In a typical Japanese company, working across functions is a permanent part of the organization chart. It is a management process designed to encourage and support communication and cooperation throughout a company.

The corporate pioneer in cross-function management for quality

is Toyota Motor Company, with 1992 revenues of $72 billion. In the early 1960s ferment of quality management, Toyota takes horizontal communication and coordination as its special problem to solve. It deliberately sets out to design a whole-cloth management process of horizontal woofs threading through vertical warps. Toyota uses Peter Drucker's divisionalized/functional classification of vertical management structures as a starting point to invent a new category of companywide *functions*. Dan Dimancescu, author of *The Seamless Enterprise,* likens this step beyond vertical organizations to Henry Ford's invention of the assembly line.'[6]

Toyota manages its cross-functions with corporate teams headed by senior line managers. They are responsible for designing the lateral work processes that have impact on the whole system. Trying various cuts and combinations over 30 years, Toyota settles on 10 top management teams that attend to these horizontal functions:

Toyota's Top 10 Cross-Functions

Quality
Cost
Research
Production techniques
Safety and sanitation
Purchasing
Personnel
Training
Information systems
Total quality promotion

Not surprisingly, one American success story in cross-function management takes place at another automaker, Ford Motor Company. Ford's Team Taurus becomes a willing student of its Japanese partner Mazda. In just six years beginning in 1980, Team Taurus improves profits so much that Ford broadens the program across the company. It sets out to shorten development time under the slogan "Concept-to-Customer."

Hewlett-Packard (HP), a considerably younger Information Age company with just a sixth of Ford's sales ($14 billion), is another American success story with cross-functional management. Beginning in 1985, HP consciously develops an enterprisewide approach to horizontal coordination. It sets up a series of "companywide councils" to formalize lateral processes in areas such as procurement and productivity. In 1990, HP establishes the Product Generation Process Organization, a focal point for the councils, comprising cross-departmental line and staff members. In its Instruments Division, HP credits horizontal teaming with these results:

? Manufacturing cost reduced 45 percent.
? Development cycle reduced 35 percent.
? Field failure rates reduced 60 percent.
? Scrap and rework reduced 75 percent. [17]

EMPOWERED CLUSTERS

Teamnets are also at work in what Harvard Business School professor D. Quinn Mills calls posthierarchical *cluster organizations*.

"The main obstacle to the rebirth of the corporation is the hierarchy," he says.'[8] One executive of a very large company tells him, "Hierarchy is dying. Everyone is sick of the rituals, delays, and inefficiencies. It's almost a corpse and soon will have to be buried." In its place, Mills proposes the cluster.

A common cluster size is 30 to 50 members, large enough to have internal administrative functions, yet small enough to be responsive. This is the "Profit Center" unit size of ABB's global teamnet structure. Typical types of clusters that make up an enterprise are:

? A core team, meaning top management;
? Business clusters with external customers;
? Staff clusters with internal customers;
? Alliance teams with external partners;
? Project teams; and
? Change teams.

Clusters draw people from different disciplines to work together on a semipermanent basis. "The cluster itself handles many administrative functions, thereby divorcing itself from an extensive managerial hierarchy. A cluster develops its own expertise, expresses a strong customer or client orientation, pushes decision making toward the point of action, shares information broadly, and accepts accountability for its business results," Quinn says.

Examples include British Petroleum's engineering organization, where 16 independent clusters of engineer-consultants are supported by three limited hierarchies that provide personnel, business, and R&D services. Another is General Electric Canada, where self-managing teams provide all the centralized services—financial, personnel, facilities, information systems. They have improved productivity and quality while cutting the workforce 40 percent. The GE Canada story also demonstrates that cluster organizations can be used for either centralized or decentralized solutions.'[9]

While clusters can replace great chunks of bureaucracy and unproductive levels, an irreducible residual hierarchy remains within the enterprise. The big question with no easy answer: How much hierarchy is just enough?

MINING DIGS UP SOCIOTECH SYSTEMS

While Deming's work is percolating in Japan, British coal miners in Yorkshire provide clues for another approach. British researchers discover that new technology impacts performance in an unforeseen way. Productivity, they learn, is not a sole function of labor-saving technology. Rather, it's the goodness of fit between technology systems and human systems that enhances performance. The researchers release a simple prescription from the labs:

> *To be successful, design the technical system together with the social system.*

By the mid-1970s, *sociotechnical systems* emerge as a major source of innovation in management practice. This proves to be especially relevant to the effective use of information and communications technology.[20]

"The high-performance work system.. . in its simplest form is an organizational architecture that brings together work, people, technology, and information in a manner that optimizes the congruences or 'fit' among them in order to produce high performance in . customer requirements and other environmental demands and opportunities," write David Nadler and Marc Gerstein.

Most American high-tech companies experiment to some degree with sociotech systems. Some, like Corning, blend sociotech with quality approaches in companywide programs. Another example is American Transtech, created by AT&T in 1983, to manage shareholder activity in the wake of the monopoly's breakup. American Transtech becomes a leader in work redesign in the United States when it reports productivity improvements of 100 to 300 percent with the company's self-directed team system, its flat three-level hierarchy, and its redesigned work processes. In the core stock transfer business, costs and staff are reduced by 50 percent.[2']

Over the last decade, there has been growing awareness on the part of the biggest consumers of information technology that they are not getting the promised vast benefits of productivity.[22] Many conclude that the biggest problem is organizational, not technological.

Information technology radically changes organizations. "People behave more empowered. Your ability to control is dramatically changed when you make it easier to move information from one person to another without a gate. When you put people on global networks, they send each other notes to accomplish a goal, but it might not be a goal anyone in the hierarchy had in mind,"[23] Judith Campbell of Xerox remarks at a conference examining the impact of information networking on the organization.

On the dark side to opening up communications systems, Wharton professor of management Michael U seem says, "The rapid distribution of information can also magnify errors."[24]

Many characteristics of today's teamnets are radically different than ever before, such as tools and techniques for communication and data handling.

> *The theme that sociotechnical systems emphasize—fit with technology—appears throughout the leading-edge examples of this concept at all levels and sizes.*

Technology networks may start small in work groups and departments, but eventually they spread to the enterprise as a whole and many interenterprise relations. It is to these "higher" levels that we turn in the next chapter, never forgetting the small groups whence we came.