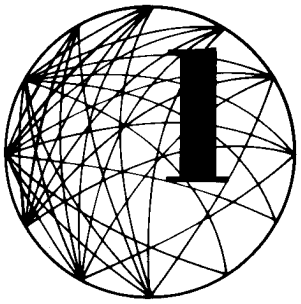

Teamnets: The Great Competitive Advantage of Boundary Crossing

According to conventional measures, a country of small traditional businesses like Denmark should be at the bottom of Europe's heap, a $28 billion global giant such as Asea Brown Boveri in a commodity industry should be in a slump like many other multinationals, and a small, old-fashioned manufacturing firm such as western Pennsylvania's Erie Bolt Company should be out of business.

Instead, Denmark, Asea Brown Boveri, and Erie Bolt all are doing quite well. What is it that a little country (population 5 million), a megaglomerate with 220,000 employees around the world, and a tiny bolt maker have in common? They all are using a new, powerful, and flexible form of organization.

? Beginning in 1989, 3,500 Danish firms organized into networks, small groups of businesses that work together. In just a year and a half, they contributed significantly to completely reversing a three-decade-long deficit in the country's trade exports.

? Instead of conducting worldwide operations from a top-heavy "headquarters," Asea Brown Boveri, a distributed global network of more than 1,300 mostly traditionally organized companies, houses only 100 professional staff people in Zurich.

? Rather than go bankrupt, the likely alternative in 1985, today Erie Bolt thrives as a network hub for cooperative vendor! supplier partnerships, choosing to "ally not buy."

Businesses that form teamnets—networks of teams that cross-conventional boundaries—will be winners in the 21st-century global economy.

Denmark, Asea Brown Boveri, and Erie Bolt are not isolated examples. From the smallest to the largest companies, businesses are climbing over their own walls. Customers, competitors, and even people in different industries traverse their traditional limits to work together. When business teams cross boundaries, benefits accrue. Whether three-person shops or multinationals, these companies can achieve something that by themselves would be impossible. By definition, teamnets are on a mission for mutual benefit.

The effect of an economy teeming with teamnets is dramatic:

Emilia-Romagna's teamnets among small companies have made that previously impoverished region of Italy the country's second wealthiest. Acting together, groups of businesses become small giants.

Although the need is different, large firms in many industries are doing the same thing, using *internal* teamnets to bridge barriers inside their companies, and *external* teamnets to bridge boundaries with suppliers, customers, and competitors.

Dateline: Denmark

Nowhere have teamnets had greater effect than in Europe, a tremendous story that remains largely unreported.

Small business in Europe is doing business differently. Instead of

starting small and growing big, small businesses employ a different strategy. They form networks and together produce results far beyond the abilities of any single company. These networks have saved jobs and spurred economic growth, precisely what all local economies need in the world of the 1990s.

For all practical purposes, companies in these "flexible business networks" are in business together. But instead of merging, they remain independent with their own financials, employees, and areas of expertise. At the same time, they act as one to pool resources and exchange complementary skills. Together, these networks generate higher profits for all by:

? Gaining access to larger markets;
? Benefiting from economies of scale; and,
? Competing with the best of the big companies.

When the flexible business network movement began in Italy's Emilia-Romagna region during the mid-1970s, that region ranked 18th in income among 21 administrative regions. A decade later, powered by networking and an explosive growth in small businesses, the region was the country's second wealthiest. Its unemployment rate went from 20 percent to effectively 0 in the same period.

In 1989, the Danish government announced a $25 million program to develop "flexible manufacturing networks." The word "manufacturing" translates loosely—lawyers, accountants, and even landscape architects all participate in Danish networks.

? Within 18 months, a number equivalent to nearly half of the country's manufacturing companies joined networks.
? In 1991, Denmark, alone of the Common Market countries, reported a positive trade balance with Germany, the mammoth economy to Denmark's south, a first in Denmark's recent history.

Subsequent independent studies show that *flexible networks* provided one key competitive advantage for this little nation. Denmark starts the 1990s with the highest per capita balance of trade in the world, surpassing even Japan's.

As northern Italy's success spread to Denmark's troubled industries, so have the Danes inspired Iceland, Portugal, Spain, Canada, the United Kingdom, and the United States. By the early 1990s, networking efforts are under way in most states, notably North Carolina, New Hampshire, Oregon, Arkansas, Michigan, Washington, Florida, and Ohio.

European governments play an important role in promoting networks: they target broad industries for development among the existing manufacturing and service base—such as textiles, metalworking, and tourism. By investing relatively small amounts of money,' the Europeans have leveraged significant results.

Around the globe, plant closings take great visible bites out of the job market, dramatizing the reality that for years big business has been steadily shrinking its workforce. In 1990, Oregon reported what so many other regions around the world have experienced. In the previous eight years, big business had shed jobs in the state, while small firms had created new jobs in all economic sectors, including manufacturing and services. In a 1991 measure, Oregon became the first U.S. state to pass "networking laws," encouraging companies to form networks. Modeling its program after Denmark's, Oregon trains network "brokers" and provides incentive grants for businesses to explore the potential of networking.

Flexible networks represent a new but proven approach to economic recovery with true *trickle-up* power. By relocating work back to small companies, the manufacturing base can be revitalized, and as a result, the service sector grows. The employment math is simple. As more small firms work together to create more business, flexible networks will put more people back to work. New jobs drive down unemployment and provide relief to empty government coffers.

As contributions to local revenues increase, more money is available for education. This meets the increasing need for trained workers and professionals. A better-educated workforce means access to better jobs and higher personal income, which decreases the demand for publicly funded social services.

Flexible business networks offer a new vision of economic opportunity.

Crossing the New Frontiers

Teamnets bring together two powerful organizational ideas:

- *Teams,* where small groups of people work with focus, motivation, and skill to achieve shared goals; and
- *Networks,* where disparate groups of people and groups "link" to work together based on common purpose.

While teamnet means "network of teams," the two ideas are complementary; each brings a unique element to the other. "Teams" imply small, in the same place, and tightly coordinated; "networks" have a sense of large, spread out, and loosely linked. "Teamnet" brings the best of both together:

- Teamnet applied to small groups means more networked teams.
- Teamnet applied to large groups means more teamlike networks.

In an ideal teamnet, people work in high-performing teams at every level, and the network as a whole functions as though it were a highly skilled and motivated team.

The teamnet factor is about organizational advantage.

Denmark, Asea Brown Boveri, Erie Bolt, and Japan clearly represent the power of people to organize for competitive advantage. Japan has few natural resources or other traditional industrial advantages. Its advantage is organizational.

The right organization gives you the right edge.

Teamnets are an *intraenterprise* way to leverage small empowered business units and an *interenterprise* way to leverage partnerships with other businesses.

By using the power of boundary crossing for mutual competitive advantage, companies can organize to tap people's potential, enter new markets, expand their product base, and invest in the future. Teamnets are organizations for the new economy of the 21st century.

BENEFITS **OF BOUNDARY CROSSING**

How does a boundary crossing teamnet differ from a conventional team?

A boundary crossing teamnet crosses traditionally guarded organizational borders. Borders remain, benefits are gained.

Boundary crossing teamnets offer a critical edge for dealing with the speed of change and the new decentralized, globalized economy. Teamnets boast three basic competitive advantages: power, speed, and flexibility.

Power

With more than one organization working toward the same purpose, boundary crossing teamnets benefit from the power of the part *and* the power of the whole. In concert together, they share knowledge, learning, skills, and resources. In Louisville, Kentucky, the Ford Explorer and Mazda Navajo come off the same assembly line; Ford does most of the styling while Mazda provides the engineering. At the other end of the scale, small businesses acting together have the buying power of big companies.

Speed

Boundary crossing teamnets streamline decision making. Multiple decision-making leaders work in parallel on different aspects of the same problem. A few phone calls replace 15 levels of signatures. Rapid realignment of resources to respond to opportunities is the order of the day. Information disseminates rapidly through person-to-person contact rather than official forms and unread memos.

Flexibility

Unlike their rigid bureaucratic relatives—organizational "stovepipes," "silos," and "chimneys"—that prevent creative response to opportunities, teamnets are highly "plastic." They bend, conform, and contort, configuring and reconfiguring to respond to the needs of the moment. Because such teams depend upon many connections among members at many levels, they are always "at the ready" to take on a new shape.

Rigid functions are so destructive at one Fortune 50 firm that some employees dread the intervention of other parts of the

company with their customers. Recalling too many lost opportunities because of battles among the functions, one engineering manager feared what he called "the Sales Prevention Effort."

Perhaps the biggest impediment to success for boundary crossing teamnets is fear of change. It takes courage to believe that working with competitors is mutually good for business, that working with other internal groups is the best thing for the enterprise when it means *your* group may have to give up a degree of control.

Every culture has its own view on why cooperation is "unnatural," why the idea "can't work here." Ironically, a fierce strain of independence is one of the necessary ingredients that make these arrangements viable. There's a healthy tension between autonomy and integration in boundary crossing teamnets. Both attributes weave through the invisible infrastructure that permeates team-nets of all sizes—from the global scale of McDonnell Douglas's proposed new jumbo jet to the local success of a woodworking network, The Philadelphia Guild.

If the ideas in the chapters ahead prove to be the trend of the future, many companies and people in many countries all will be winners.

"Seeing the Obvious," chapter 2, and "Linoleum, Furniture, and Electrical Systems," chapter 3, provide the five principles and key examples you need to understand "the teamnet factor." In "In It Together," chapter 4, and "Inside-Out Teamnets," chapter 5, we explore how large firms use these principles. "Small Giants," chapter 6, and "Instead of Layoffs," chapter 7, describe how small companies use teamnets to astonishing bottom line advantage.

In "Harnessing the Power of Teamnets," section II, we show you how to develop teamnets. We build from a "Quick Start," chapter 8, which addresses small teams, to a more detailed methodology in "Launching Teamnets," chapter 9. "Those That Do, Plan," chapter 10, and "Transforming Bureaucracies and Systems," the Reference Section at the end of the book, provide concepts and tools for addressing large and complex teamnets. Failure is the theme of "Rascals in Paradise," chapter 11, to emphasize the "use with caution" warning that comes with our teamnet prescriptions. In "Fighting

Fire with Organization," chapter 12, we wrap the major themes, examples, and conceptual tools together. "The Risk of Democracy," our Afterword, pushes the envelope of teamnets and steps up to look at business networks in a larger context.

Co-opetition: When Competitors Cooperate

Compete *and* cooperate. Many businesses will not survive into the 21st century unless they resolve this apparent contradiction. Will yours?

There is a great strategic change under way in the way the world does business.

Companies cooperate and compete at the same time.

The competitive advantages of cooperation come from doing things together that cannot be done alone. The cooperative advantages of competition arise from innovation and striving for excellence.

"Co-opetition" is the oxymoron that combines the words "cooperation' and "competition." You may have already heard the term, perhaps used in a context like this TV story about the auto industry:

> The Big 3 auto makers meet with their Japanese counterparts on May 18, 1992, in Chicago. They are setting up "a number of task forces to explore areas where Americans and Japanese can work together for mutual benefit," Peter Jennings explains on ABC News. "Cooperation between U.S. and Japanese companies has produced a new word—'coopetition'—which industry analysts say may be the wave of the future," reporter Al Dale tells the viewers using this newly minted word. "[It] may be the only way for some car makers to survive in years to come."[2]

Coined word or not, co-opetition perfectly captures the difficult-to-describe dynamic of independence and interdependence. This dynamic is at the core of the new, emerging flexible organization style that so many companies are attempting to emulate. Fast replacing the old, hierarchical bureaucratic organizational machine, the flexible organization uses cooperation to cross boundaries, instead of competing to dissolve them.

CAUTION: PARADIGM SHIFT AHEAD

The word "co-opetition" is the sort of strange made-up concoction that drives linguists crazy. Cooperation and competition are not usually strung together in the same sentence or even the same thought. Usually, they are opposites: If you cooperate, you can't compete. If you compete, you can't cooperate. Even so, people use the word to describe something important about a new way of doing business.

- When Siemens Nixdorf announces its entry into the $16 billion U.S. systems integration market, Heinz Kagerer, vice president, says they "will follow a policy of co-opetition—the ad hoc cooperation even with competitors."[3]
- When Luc de Brandere, whom the Belgian press describes as "the iconoclast of the stock exchange" (he was once head of Belgian Friends of the Earth and "writes obscure scientific books"), takes control of the Brussels Bourse in 1990, he says he will restructure the Bourse around "co-opetition, a mixture of cooperation and competition."[4]
- Novell's chairman Ray Noorda calls co-opetition his "business philosophy... We decided we would partner with anybody and everybody that made sense." Instead of a sales force, the company uses 13,000 independent distributors. The strategy works: sales and earnings have soared.[5]
- Ted Engkvist, president of NYNEX'S Information Solutions Group, says the word "co-opetition" means "We're a competitor

today, a loyal customer tomorrow, a buyer the day after and a joint partner the day after that."[6]

While "competition" is an easy word to swallow, "cooperation" can make some business people choke.[7] Boundary crossing teamnets are an easy, palatable way of bringing the two ideas together.

WHAT IS A BOUNDARY CROSSING TEAMNET?

Boundary crossing teamnets are the business wave of the future. They include independent members who voluntarily coordinate their activities. Most people already participate in cross boundary groups, perhaps without realizing it. Any task that involves plans, meetings, and joint actions with people outside your own organization—suppliers, customers, or competitors—requires a boundary crossing teamnet. Formal arrangements, that require two or more groups to work together on an ongoing basis, operate through a boundary crossing teamnet.

The trick is to: work together without giving away key trade secrets; share openly in well-defined areas while not being naive about unique differentiating advantages; and to cooperate without caving in to least-common-denominator thinking.

> *Members of boundary crossing teamnets work across conventional boundaries, cooperating for mutual benefit while retaining competitive independence.*

Teamnet features appear in many new management innovations that have popped up at all levels of organization in the past quarter century:

? Small groups in companies use quality circles, self-managed work groups, and cross-functional teams as participatory, flexible organizations.
? Big companies institute total quality management programs, high-performance work systems, and internal markets to introduce large-scale changes inside.
? Joint ventures, alliances, consortia, and flexible manufacturing networks remake the maps of external corporate relations.

All these innovations are variations on common teamnet themes, people crossing boundaries that are normally "off-limits." It's easier than you might think.

Teaming Inside and Out

Traditionally, most people have worked for one company with other fellow employees. Within their company, people have worked in a particular area, almost exclusively with co-workers from their department. At least, this is the official version of how work gets done, as given by the formal organizational chart. Well, good-bye order, and hello messiness.

The demand for greater speed and flexibility turns the organized world of work inside out. "Inside" and "outside" depend on multiple points of reference. Gail Snowden, a financial services executive, in effect holds four "badges" simultaneously: at Bank of Boston, where she is president of First Community Bank, the bank's inner city urban network of branches and lenders in three New England states; at the City of Boston, where she represents the bank as a board member of the Boston Local Development Corporation, an urban economic development project; at Fleet Bank, where she works with her competitor both on that board and on the Massachusetts Minority Enterprise Investment Corporation, a multi-bankowned vehicle for providing small business loans to minority- and women-owned businesses throughout the state; and at Simmons

Graduate School of Management, where Simmons is following Snowden in its first case study on a woman of color in a significant position of power. Multienterprise relationships such as Snowden's cross all kinds of "state lines."

Today, people regularly work across divisions in their own firms, forging new links with people from other groups, departments, or subsidiaries of the company. Toyota, in the interest of quality, has developed all kinds of cross-functional teams. Toyota's success inspired similar efforts at Ford, and, later, scores of other companies outside the auto industry. These multiunit teams cross internal organizational "city limits."

Whether inside companies or between companies, these teams and alliances require a new kind of thinking to be successful. For instance, beware competitor bashing: today's competitors may be tomorrows colleagues. Remember Super Bowl 1984? You may have forgotten the game, but you remember the commercial. Apple Computer launched its "1984" ad campaign George Orwell style: a perfectly fit young woman runner hurls a fatal weapon against the only thinly disguised old men running Big Blue. Seven years later, Taligent is under way, IBM and Apple's joint venture. In the '90s, the youthful Cupertino upstart in jeans works side by side with the aging Armonk blue suit.

> *It's too complicated and too expensive for any size company to go it alone all the time. Today, going it alone means missing opportunities. Tomorrow, it means going out of business.*

The "little people" are doing exactly as the big companies. While the restaurants in our Boston-area neighborhood compete for the lunchtime crowd—Brigham's, Cherry Tree, and even Captain Marden's, the local fish store—they all cooperate to promote "Square Dollars,"

a local economy good only in West Newton Square. To enhance your business opportunities, think differently about all your relationships:

? Customers, once the passive distant receivers of products, now are part of their vendors' product and service development programs.

Kodak's Black and White Film organization (nicknamed "Team Zebra"), which has produced a continuous stream of breakthrough products in record time, has regularly included customers on its teams. Steve Frangos, former manager of Black and White Film manufacturing, eschewed what he calls the "hand grenade" principle on Team Zebra—"throwing the design over the wall." Instead, customers "were in on the design from the beginning, including people from other parts of Kodak, like the marketing organization, and outside customers who bought the products."

? With cash flow slowed and credit extremely hard to come by, suppliers become partners.

Instead of buying the major parts for its new plane, the MD-12, Douglas Aircraft came up with a different plan of partnering with its suppliers. Partners would *invest* their components—the wing, the tail, the engines—and get paid when the airlines bought the planes.

? Supplier-customer relations also exist inside the company, between interdependent departments and in the groups that provide products and services to one another.

Cross-functional teams coordinate across the sometimes great walls of internal politics in Conrail's Strategic Managers Group and across borders in Armstrong's five global management networks. Even the smallest of firms specialize functions—one person

does the books, another does the purchasing, a third does the deals —but they all have to work together to make the business successful.

Boundary crossing teamnets are
businesses' potential secret weapon.

They offer greater diversity of expertise, experience, and skills as problems become more complex and increasingly difficult for one person, one small group, or one company to solve. Quality circles at Komatsu, autonomous work groups at GM'S Saturn plant, and project teams at Arthur D. Little, Inc., the international consulting firm,[8] all interact cooperatively, drawing people from across their companies. At the same time, they give people more freedom to contribute and to balance home and work life.

Colleagues, vendors, customers, and competitors are all members of boundary crossing teamnets. These new alliances allow groups and companies to quickly configure and reconfigure their relationships to take advantage of changing business realities.

Why is this happening? How have we gone from the steady state of a single boss and strict allegiance to one chain of command to the dynamic challenge of working in many places across traditional boundaries?

Why? Because things are getting faster, more complex, and
more global. No matter how big we are, we can't do it all, all by ourselves.

Whether they are well known—as in Armstrong, once synonymous with the word "linoleum"—or not known at all—as in ACE net, a network of small firms that design and build kitchen appliances for the disability equipment market, companies today depend upon *boundary crossing teamnets.* Whereas not so long ago working with the competition was an unthinkable sin, today not figuring out how to work with the competition may be a deadly one.

"SMALL IS BOUNTIFUL": TEAMNETS AMONG THE LITTLE PEOPLE[9]

In the United States, small business, when taken as a whole, is really big business. The country's 20 million small business entrepreneurs employ half the nation's workforce, account for 40 percent of GDP, and create the majority of new products and technologies. Small businesses are also now the major contributors to new employment: in some areas, small business creates two out of every three new jobs or more.

This time a revolution in management practices is not passing by small business. In the new world that emphasizes speed and flexibility, smart combinations of small firms have real global competitive advantages, and create benefits that dramatically appear on the bottom lines of nations.

Flexible business networks among even the smallest of companies can yield dramatic results. From Denmark to Denver, small companies create boundary crossing teamnets to compete in markets that traditionally lock out individual firms as the cost of business goes up. In the United States, networks among small firms exist in all parts of the country:

- On Florida's north coast, 16 member companies of TEC-NET (Technopolis Network/Silicon Coast Corridor), which previously competed fiercely for defense contracts, set aside their differences. Instead, they collaborate to design, manufacture, and market a high-quality laser printer.
- In Pennsylvania, five small woodworking firms, seriously threatened by the recession, join forces in The Philadelphia Guild, which markets a new line of home office furniture.
- In southern New Hampshire, Team Nashua, 10 electronic component manufacturers, band together to offer "electronic packaging" for their customers. Joseph Roberts, CEO of Advanced Circuit Technologies, Inc., the convener of Team Nashua, anticipates that its first big contract for $1.2 million with Compaq is

the harbinger of things to come. “We expect to do $4 to $10 million in additional business in 1993,” he says. [10]

In textiles, metalworking, landscape architecture, woodworking, plastics, secondary wood products, disability devices, apparel, waste management, software, golf courses, and even cemeteries, companies are finding it is better to grow together than to go it alone.

TEAMNETS SOLVE SOME BIG PROBLEMS FOR LITTLE COMPANIES

Teamnets can solve many different problems for small businesses. For businesses locked out of markets that favor economies of scale, teamnets of allied companies are the answer. By sharing costs and knowledge in areas that only the big companies can traditionally afford, small companies can do the work of giants. Their competitive parity is achieved without giving up the independence and benefits of a small enterprise. Companies don’t form boundary-crossing teamnets in the abstract. Teamnets are most often created for specific purposes. Some typical reasons are to:

Purchase Cooperatively

The Southeastern Massachusetts Sewn Products Network buys thread together at a 15 percent discount, which means $100,000 per year in savings to one member.

Market Jointly

The nine black American artists who own stores in 1800 Belmont Arts in Washington, D.C., where they sell products reflecting African-American culture and heritage, found their combined mailing list numbers 100,000. “We’ve already done radio interviews

together and plan to do joint promotion," says Diane White, the owner of Blackberry, a small chain of stores in the Washington, D.C., area offering Afrocentric gifts and clothing.

Combine Research and Development

Five Massachusetts metalworking firms pool resources to research solvents for parts cleaning.

Co-sponsor Training

Twenty Arkansas high-end furniture-finishing companies share training on new finishes and their environmental regulation implications.

Set Up Quality Programs

Some 35 high-tech companies—ranging from Bolt, Beranek and Newman to Polaroid to Carrier Corporation—cooperate to form the Center for Quality Management, which teaches quality concepts at all levels of the corporate hierarchy.

By combining forces with other companies, businesses benefit from economies of scale. Working with others provides access to complementary products and services, which, when combined, provide a much larger offering to customers.

Can We Partner?

Among large companies, teamnets make for some complicated arrangements. For example, Deutsche Aerospace, a partner in Europe's Airbus consortium, announces at the 1992 Berlin Air Show that it now exchanges engineers with Boeing. The obvious compli-

cation here is that Boeing and Airbus, as the only players besides Douglas Aircraft left in the world's commercial aircraft business, are arch competitors. Deutsche Aerospace and Boeing face a major challenge in managing their boundary crossing teamnets—both on the corporate level and on the ground as small groups of engineers get together to implement the agreement.

Aerospace is particularly predisposed to "teaming" since costs are so great and customers are so few. With the high cost of new product development, no single company can afford to be the sole investor. As the military buildup topped out, defense firms found themselves forced to partner with arch rivals: Rockwell and Boeing, Northrop and General Dynamics, Lockheed and McDonnell Douglas, found themselves in partnerships. On NASP, NASA'S space plane, five major competitors jointly developed the first designs.

"There are many more engagements than there are marriages among big companies," says Pamela Johnson, a Digital Equipment Corporation engineer turned management consultant. "There are more marriages than there are good marriages. And because of the enormous capital investments, companies cross-supply each other in all kinds of specialties." Her company specializes in certain technologies that the public is not even aware of, such as thin film heads, for example, which the other big computer companies buy from Digital. Digital in turn buys small computer memory tape systems from Hewlett-Packard and large ones from IBM, while also supplying information storage assembly components to other storage manufacturers.

In Silicon Valley, networks among start-ups in the semiconductor field are as common as new generations of chips: some 350 strategic alliances have been formed since 1979.

To get an idea of how complex these relationships can be, consider the emerging field of multimedia, the electronic combination of words, images, sight, sound, and motion. Apple has at least six major relationships that are so complex they nearly defy being put into words. Apple partners with:

? AT&T/NCR to invest in Echo Logic;
? AT&T/NCR and Sony to invest in General Magic;
? IBM to invest in Kaleida;
? IBM and Motorola to invest in Taligent;
? Sony directly in a strategic alliance; and,
? Toshiba directly in a strategic alliance.

Meanwhile, Sony has a separate strategic alliance with Microsoft, Matsushita has a separate alliance with AT&T/NCR, and Toshiba has an alliance with IBM, which in turn has separate alliances with both Hewlett-Packard and Intel. Although not every high-tech arrangement has been successful—and some among the megafirms are downright suspect as efforts to squelch the competition— technology companies are important testing grounds for many of these new business ideas.

Some companies now appear to *specialize* in multiple partnering arrangements, like Corning, Inc., a self-described "global network," formerly known as Corning Glass Works (where perhaps, like us, you bought miniature glass animals when you were a child), the company that makes Corning Ware, the dishes you can drop on the floor without breaking. Corning now participates in nearly 40 joint ventures. Likewise, Perstorp, the Swedish specialty chemical firm, has a similar number of entrepreneurial partnerships. According to a *Biotechnology 91* survey, the larger biotechnology firms, numbering 300 or more employees, participate in nine strategic alliances on average.

For big companies, working in teamnets is also the solution to many common problems inside the enterprise:

Running Into Walls, Stovepipes, and Silos

Internal groups wage war on a fragmented project that crosses functional borders; and departments become so protective of their turf that they refuse to appropriately work with other parts of the company.

Moving a Centralized Bureaucracy

Key projects and strategic programs that require multigroup collaboration are stymied by the central group's slowness, rigidity, and unwillingness to change.

Getting a Life

As the need for creativity sharpens, the tradition-bound organization with no spirit of initiative or innovation wants to "do this one just like we've done all the others," as the company goes out of business.

Big company or small, teamnets provide the infrastructure to get things done.

PROBLEMS IN PARADISE

Teamnets may sound like the answer to all business problems—they increase competitiveness, profits, and jobs. But don't the same problems that exist within companies and groups plague them when they move to this new style of doing business?

Of course they do. Not every boundary crossing teamnet succeeds. Some networks have gone belly-up the minute their government funding ran out. Their purpose was never completely clear, and so without the influx of cash, there was nothing to keep the teams working together to survive. Six of Corning's strategic alliances have failed, some for market reasons, some for lack of organization. One particularly high-profile alliance highlights unanticipated problems with independent partners: Dow Corning took some heavy hits in 1992 when the silicon gel breast implant controversy moved to the front page.

A boundary crossing alliance in-the-making shows the not necessarily successful application of the teamnet principles on a very large corporate scale. The early story shows both the necessity of

looking for new partners by even the biggest companies, and the enormous difficulty an old-line company has in re-creating itself. Although it remains to be seen whether the company will be able to pull off its challenging teamnet idea, its proposal is a harbinger of many projects to come.

BUILDING A NEW PLANE IN MANY PLACES

The situation that Douglas Aircraft faces as it sets out to **build** its new plane in 1990 is that it has no capital. The MD-12 is designed to be the successor to an illustrious line of airplanes stretching back through the DC-b, DC-9, and Donald Douglas's first great hit, the DC-3.

If history were to repeat itself, sometime in 1997, the first in the next generation of jumbo jets designed to compete with Boeing's aging 747s will roll out onto the tarmac in Long Beach, California. Lakewood Avenue, where Douglas Aircraft's headquarters is situated, is a strange sight at night, with the stadium lights flooding the huge iron birds. The company paints its behemoths next to the football-field-sized hangars where they build the planes. The noise level is so intense that most people in the hangars wear ear protectors.

Outside on the tarmac, crews on three-story-high ladders transform the nearly completed vehicles from their mottled Army-fatigue hue to the sleek, attractive color-coordinated airborne *objets d'art* that we associate with jet airliners. However, not a single MD-12 will roll out of the Long Beach hangars, change colors, then glide across the street (in the middle of the night so as not to disturb traffic) to the takeoff runways. Douglas will not build its new plane in Long Beach at all. Rather, it will be built in pieces all over the world and assembled in a "greenfield," a brand-new industrial park of 30 tenants gathered just to manufacture MD-12s.

Building a jumbo jet is a daunting process. To be state-of-the-art, this plane will consist of at least 700,000 designed parts, ranging

from the very large like the fuselage, wing, and engines, to the very small, like knobs in the cockpit and fixtures for light bulbs at service points.

It costs a lot to build a new plane, probably far more than you would guess unless you're in the aerospace industry. Douglas Aircraft projects the cost to build the first copy of its next-generation, wide-body, long haul vehicle at *$5 billion.* Very few companies anywhere in the world are able to foot the product development bill for such a gigantic project—even if the plane's sticker price is $130 million, and the total market size (of which Douglas hopes to capture 30 percent) is estimated at $300 billion over the next 20 years.[11]

In the early 1990s, Douglas certainly is not in that position, even though until the MD-12 (and since the early 1920s, when Douglas first set up shop in Long Beach), it has built every one of its planes by itself—from the DC-1 to the MD-11. (They switched acronyms from DC to MD after the DC-10, which was the last plane that Douglas itself designed before St. Louis—based McDonnell Aircraft bought it in 1967.)

Each manufacturer of the planes major parts—the wing, the tail, the avionics, the computer systems—will not be a supplier, vendor, or contractor, traditionally adversarial relationships in aerospace. Instead, the manufacturers become risk-sharing partners: they invest the up-front capital needed to build their part. Then, when the planes sell to the airlines, the partners reap their share of the rewards.

Imagine a plane built with a Taiwanese tail, a Canadian fuselage, Spanish wings, English engines, and American computer systems. Some of the estimated 30 global risk-sharing partners are Douglas's fiercest competitors. The MD-12 "campus," as large companies affectionately refer to their corporate settings, will be globally distributed, a virtual place where the sun never sets.

Does inevitable failure doom such an undertaking? Douglas can succeed only if it concentrates as much on its organizational problems and opportunities as it does on its technical ones. Like its competitors, Boeing and Airbus, Douglas knows how to build very

good planes. Neither Douglas nor Boeing is a world leader, however, in the new management required to coordinate work across corporations, time zones, cultures, and continents.

Airbus, the upstart newcomer that has surpassed Douglas as the world's second largest commercial aircraft producer, may have a leg up on its competitors in this regard. Airbus is an entrepreneurial consortium funded by a group of European nations, a very large-scale boundary crossing teamnet.

Douglas' new plane is one development program to watch, not for the MD-12's metrics on its thrust and loft, but rather on its innovation in designing and coordinating its partnerships.

So, if Douglas Aircraft is able to pull off its ambitious plan and you someday find yourself on board an MD-12, take a look around. You'll fly on a bird built by what is likely to be a record number of boundary crossing teamnets. If Douglas attempts to build the MD-12 alone, it will not succeed. You'll never take that flight unless Douglas successfully learns the skills of co-opetition.

> The supreme challenge of the 21st century will be the ability to manage projects that transcend all the conventional boundaries, whether to produce global products or prevent global warming. The bureaucracies of the Industrial Age with their rigid focus on in-house protocols will appear to the new inter-corporate transcontinental networks as old Royal typewriters do to PC users. [12]

Barbecued Sushi and Competition Among Nations

Perhaps it is not surprising that teamnets are developing at a rapid rate in countries as historically different as Japan and the United States. Each of the different national characters—Japanese collectivism and U.S. individualism—carries strong seeds of the other.

East and West are moving to network organizations from complementary directions. In the East, the whole group has historically

been considered more important than individuals. In the West, we put more emphasis on the individual than the whole group. So, in the United States, we find ourselves explaining networks as a way of developing more cooperative and group-oriented organization without diminishing the importance of individuals. We emphasize the importance of group factors like cooperation and planning in seeking a balance with individualistic cultural tendencies.

In Japan, the need is just the opposite. Networking becomes a way to foster personal development, enhancing individual creativity, initiative, and responsibility without diminishing the traditional importance of the group. In Japan, networkers emphasize the role of individuals in seeking a balance with group-oriented cultural tendencies. ‘~

At the September 1990 meeting of the University of Michigan's annual automotive seminar, Alfred H. Peterson III, chairman of a relatively small auto spring manufacturer (sales under $100 million), finds a clever way to highlight the difference between America and Japan. "Sushi is beautifully presented and wrapped," he says, "with everything in place and perfect. Barbecue is made up of pieces of pork or beef swimming around in a big pot. The dissimilarity of these two dishes is symbolic of the great difference in the way our economies are organized and our auto industries function."

"The Japanese system relies on interdependence, while the North American is based upon independence."14

Are the Japanese ahead in the race to uncover the secrets of successful co-opetition? If they are, should the United States emulate them?

Rather than calling for Americans to copy the Japanese system, at the automotive seminar Peterson suggests "much closer but better-balanced supplier relationships, rigorous pursuit of

continuous improvement and a genuine re-evaluation of the true importance of people who get dirty while getting things done the right way."

Both Japan and America have something to learn from one another about independence and interdependence. Each has opposite strengths and weaknesses. Each starts with a cultural advantage: Japan's is cooperation, while America's is competition. Japan is learning the game of individual initiative against the cultural prohibition against being different. Americans are learning new ways to cooperate against the great historical resistance of die-hard independence.

Europe seems to occupy a middle ground. Europe is home to Western civilization's emphasis on the individual, but does not extend it to. America's extreme. Europe's coordination often comes from the top down, from many small nations, principalities, city-states, and ethnic groups. The European Community is one of the planets grand experiments at a supranation network designed to benefit all its members, national and individual. For small companies, Europe provides lessons for flexible business networks; for large companies, examples such as ABB's internal markets are cutting-edge management innovations.

Cooperation *and* competition. America, with its caldron of diversity, has the harder row to hoe than Japan or Europe to bridge differences with beneficial relationships. But if the highly heterogeneous United States succeeds, it may show the world how even the greatest extremes can work together productively and profitably.

Networking is a global business philosophy. It is being driven by the pace of change and the worldwide need to find flexible new ways of managing in the 21st century.