SECTION II

THE
BIG IDEA

The next two chapters give the Big Picture: the Age of the Network as the fourth era in the evolution of organization.

By understanding the features of each age, you can understand and benefit from the interplay among small groups, hierarchies, bureaucracies, and networks. It's important because you have to live and work in all these forms simultaneously.

First, in chapter 2, "From Nomads to Networks," you learn about the interplay through a familiar example that contains all forms of organization—the local fire department. Then, in chapter 3, "Turning Hierarchy on its Side," you discover how an exceptional corporation blends the old and new, illustrating the key ideas of each age.

FROM NOMADS TO NETWORKS: THE FOUR AGES OF ORGANIZATION

THE 21ST CENTURY BUCKET BRIGADE

In the past 10 years, the city of Boston has halved its serious fire rate. Likewise, the U.S. rate has dropped by a third. While this is welcome, unexpected public safety news, it carries some surprising pointers for all kinds of organizations.

As government, business, education, nonprofits, and even religions struggle to reinvent themselves, all are reaching for the perfect way to organize. Unknown to the city's 1,570-member fire department, Boston's plummeting rate of multiple-alarm fires holds certain keys to that struggle.

In *1975,* the United States had the highest fire rate in the world. Even though **it** was the world's richest country, with the most sophisticated fire-fighting apparatus, its fire rate was twice that of neighboring Canada. Ironically, countries with the most flammable housing materials, principally in Asia, had some of the lowest fire rates in the world.

There had never been a serious national effort to prevent fires until the mid-1970s. "Only you can prevent forest fires," Smokey the Bear warned, but since most of us didn't live in the forest, this hardly

addressed the problems of the South Bronx and South Boston, which were then burning. American children learned the fundamentals of traffic safety but not the basics of fire prevention. Every school child learned to "Look both ways before crossing" but not that "Matches are not for children."

About 20 years ago, Congress passed legislation to create the National Fire Prevention and Control Administration (NFPCA), housed in the Department of Commerce. In 1975, NFPCA inaugurated four major initiatives: improved data collection, arson investigation, training, and fire prevention.

Quite by accident, the Boston area became a hotbed, so to speak, of fire prevention activity. Working with The Children's Museum and our consulting company colleagues, we spent the next three years on national fire prevention education.

In parallel, Boston's Shriners' Burns Institute, Newton's Education Development Center, and the National Fire Protection Association, the trade group also headquartered in Boston that released the 1993 statistics, developed burn prevention programs, the most famous of which were Dick Van Dyke's popular "Stop, Drop, and Roll" TV commercials. They originated in the Boston trade group, funded by the Consumer Product Safety Commission.

Two realizations quickly surfaced when the work began. First, while the fire engine can wail its siren and push traffic aside, fire fighters cannot force people to be fire safe. Fire prevention requires education, not enforcement.

Thus it made no sense to follow the usual federal model: design a program in Washington and ship it out to the field. Instead, we connected the already successful local fire prevention officers across the country. Together we extracted the basic principles of fire prevention education, which we packaged in a variety of print media—from wall charts and comic books to bibliographies and directories. From these materials, local fire fighters were able to adapt their own programs.

The second realization: there was no such thing as a national fire problem. Instead, there were myriad local problems. In Southern

California, as we painfully witness every year, there were brush fires. Chicago—and most other large cities—suffered from a rash of "youthful fire setters." Elderly people in Dade County, Florida, put locks on their doors while placing themselves at risk for quick escape from fire.

In each locale, we found experts—usually fire fighters—who had invented unique, effective, creative programs for their communities.

The startling decline in Boston's fire rate, as well as the nation's, indicates that the 1970s fire prevention effort proved successful over a long time.

"We set a goal to reduce fires in the United States," says Gary Briese, director of the International Association of Fire Chiefs. "We have been more successful than we ever imagined we would be."[1] By "we," Briese, of course, didn't mean his organization alone, but rather implied a massive, largely unrecognized, network of people and groups involved in the overall fire reduction effort.

Surprisingly, fire departments, typically regarded as among the least innovative organizations, turn out to be among the most adaptive for the 21st century.

PUTTING IT ALL TOGETHER

American fire departments incorporate all forms of organization— small groups, hierarchies, bureaucracies, and networks of all sizes.

Fire fighting captures the headlines. The department springs into action as a hierarchy when battling blazes. It prepares for the crisis with command and control and practice and training. If your home erupts in flames, you don't want a group standing around trying to reach a consensus on how to approach the problem. You want someone calling the shots for a highly skilled group of professionals who understand how to deal with heat, chemicals, and combustion out of control.

While fire fighting gets public attention, departments spend only a small part of their time putting out fires (in Boston, only *5* percent). The department acts as a bureaucracy that enforces codes for much of the day and makes certain that pressure is sustained in water lines, that training is updated, and that apparatus is maintained. A chief shouting orders is of very little use if the hydrant isn't pumping. Here you need experts who understand pumps, pressure, and the mechanics of the city water system. Uniform codes fight fires, too.

Fire fighters often use person-to-person networking for fire prevention, which requires education, persuasion, and role models, by working directly with people in the community. School children have no patience for—or need to know about—sprinkler requirements. Their parents need to get the message about the importance of smoke detectors, fire extinguishers, and a second exit from bedrooms. The glamor of a visit to the local fire house and a ride on an engine leave indelible memories in children's minds, but they don't make children fire safe. Commitment to ongoing education does, a distinct and suitable role for networks together with small groups.

Fire departments forge large, interorganizational networks for mutual aid. A group of communities agrees to act as a virtual fire department and back one another up during a particularly bad fire in one locale. Each community gains protection and reduces costs. Here local hierarchies use interlocal networks to achieve something together that they cannot achieve alone. In this field, as in many others, people also use organizational networks to pass legislation, share information, take on large-scale education efforts, and promote professionalism.

All kinds of organizations can learn from the local fire department. In emergencies, command and control prevail. For routine situations and environments, rules and regulations provide standards. Networks educate, innovate, motivate, and provide backup when a hierarchy reaches its limits.

Fire departments—among the oldest of America's institutions and found throughout the world—may be role models for the 21st-century organization.
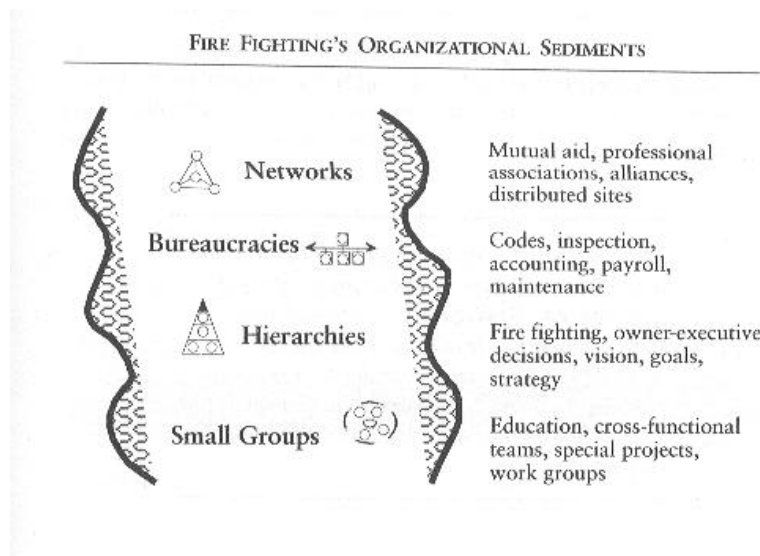
A SLICE OF TIME

A fire department provides a cumulative "geologic slice" of the evolution of organizations.

Small groups make up the deepest layers. Hierarchy, with its chiefs and sergeants, is the next layer, imposing vertical control. Bureaucracy appears in more recent layers, bringing horizontal specialties. Finally at the top, in the verdant living topsoil, we see intensely linked networks.

Most organizations have mixed forms.

> ?? Ninamary Langsdale's marketing and communications group in the Pittsburgh office of KPMG Peat Marwick works side by side within a few feet of one another and as part of a virtual team scattered from New York to Kentucky to serve an account. Meanwhile, corporate headquarters, home of the hierarchy, is alive and well in New York.

FIRE FIGHTING'S ORGANIZATIONAL SEDIMENTS

Networks — Mutual aid, professional associations, alliances, distributed sites

Bureaucracies — Codes, inspection, accounting, payroll, maintenance

Hierarchies — Fire fighting, owner-executive decisions, vision, goals, strategy

Small Groups — Education, cross-functional teams, special projects, work groups

Traditional face-to-face small groups continue to be the basic working unit today. At the same time, information-enabled virtual teams cross functions, deliver results to customers, and undertake special projects, while the 100-year-old hierarchy continues to set strategy.

? Chicago's Pritzker family, which owns Hyatt Hotels Corporation, sets the company's long-term goals. The corporation's executives, also concerned with goals, operate the business.

Legitimized by owners, hierarchies provide executive functions. They set goals, maintain authority, and cope with crises, while the senior employees maintain the bureaucracy.

? When an executive at the U.S. Postal Service wanted to bring in experts, a process that could take months, she was able to turn around a purchase order in less than a week.
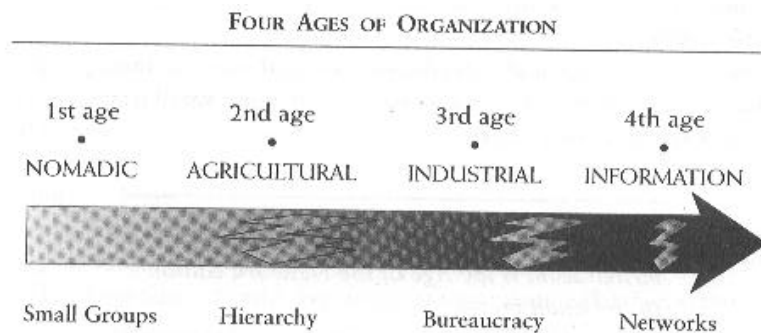
Although most people complain bitterly about them, bureaucracies, when appropriate and enabling, can be elegantly functional, high-performance entities. They standardize contractual agreements and develop common methods by which work gets done and paid for. This woman knew how to network within the system.

? AT&T Universal Card Services redesigned its core business process in three months by involving people from all levels in the company.

> *In networks, people link as they cross internal functions, geographic boundaries, and even corporate lines with remarkable speed. The people in the network come from the bureaucracy and the hierarchy. Their new relationships to one another create the networks.*

WHAT'S OLD, WHAT'S NEW

All business, indeed, all humanity, is in transition from the Industrial to the Information Age. Alvin Toffler's 1980 book, *The Third Wave,* caught the crest of an idea almost four decades in the making. Now it is conventional wisdom. Three waves divide human history into four great ages characterized by the nomad, agriculture, industry, and information.

FOUR AGES OF ORGANIZATION

1st age	2nd age	3rd age	4th age
NOMADIC	AGRICULTURAL	INDUSTRIAL	INFORMATION
Small Groups	Hierarchy	Bureaucracy	Networks

> *Each new age of civilization has its signature form of*

organization.

? People first honed their *small group* skills as nomadic hunter-gatherers.
? *Hierarchy* grew up with agriculture.
? The Industrial Age gave birth to *bureaucracy.*
? The Information Age brings *networks.*

A network is a form of organization, like hierarchy and bureaucracy, one of the basic designs we use to construct our social world.

Teamnets of the 21st century span the life of organizational development. Teamnets are at once very old and very new. The team is the small group, rooted in the very old and drawing on skills accumulated over millennia. Networks are the very new, meeting the need for greater scope, speed, and flexibility. They grow at the creative leading edge of change.

WHAT IS YOUR SMALL GROUP?

Thirteen people run IBM's major business units. Five people are on the Executive Committee of the Unitarian Universalist Ministers' Association. Four vice presidents at Qantas Airways ran its reengineering project. Two people own and manage Cafe Appassionato, our local coffee shop.

We have always—and will always—live and work in small groups. Small groups permeate business: microcompanies, small teams in big firms, executive committees.

> *The high-performance, information-enabled, virtual team is the Age of the Network edition of the small group.*

Each age adds its special characteristics to the previous one. Small groups are basic social cells that have personalities and identities. People even name them. Small groups carry the seeds of later organizations. As people gain status in new roles and perform tasks, they expand the vertical and horizontal dimensions of organization over the ages.

FROM STATUS TO HIERARCHY

Bill is in Ellen's group. Ellen is on the general manager's staff, which reports to a vice president close to the CEO, who is accountable to the board. In hierarchy, there are many status bands of low, middle, and high ranks with even more grades within them.

> *Hierarchy dramatically steepens the who's-on-top status dimension in small groups.*

As the source of legitimacy in business, owners, who have capital, also bring hierarchy. They officially crown an authority structure of executives and workers.

Hierarchy has helped people build societies among strangers throughout history. As businesses grow beyond the point where everyone knows one another, hierarchies become inevitable.

"Three years ago, all my employees, customers, and suppliers would have fit in this room," said US TeleCenters' CEO, Frank Reece, addressing a few dozen people in one of our workshops. "Now I have 350 employees, thousands of customers, and dozens of suppliers. I can see the bureaucracy growing, and I'm afraid I'm going to create a company I hate."

Every successful entrepreneur bemoans the loss of the "family feeling" as greater size demands structure and formality.

The Egyptian pyramids are the great organizational achievement of the Agricultural Age, the literal eternal symbol for successive ranks

culminating in a pinnacle of power. Every time we see a traditional organization chart, the pyramid comes to mind.

Hierarchies alone are not enough. Success brings change, and simple hierarchies are notoriously unstable in the face of the unexpected. Ancient empires rose and fell as populations expanded and capacity became overextended. Boom-bust and on to bureaucracies.

BRING ON THE BOXES: THE BUREAUCRATIC SPECIALTIES

Science ushered in the Industrial Age. Behind logic and the laws of motion chugged the steam engine. Its cargo? Another organizational revolution: rational bureaucracy.

Bureaucracy bulged out sideways with
specialized functions, tasks, and roles.

For 300 years, corporations, nations, and organizations of all kinds became more efficient with the organizing prowess of bureaucracy. Bureaucracy, while specializing horizontally, embraced hierarchy, which controlled vertically. Together they managed much greater complexity than either could do alone. The Industrial Age became much more complicated than the Agricultural one.
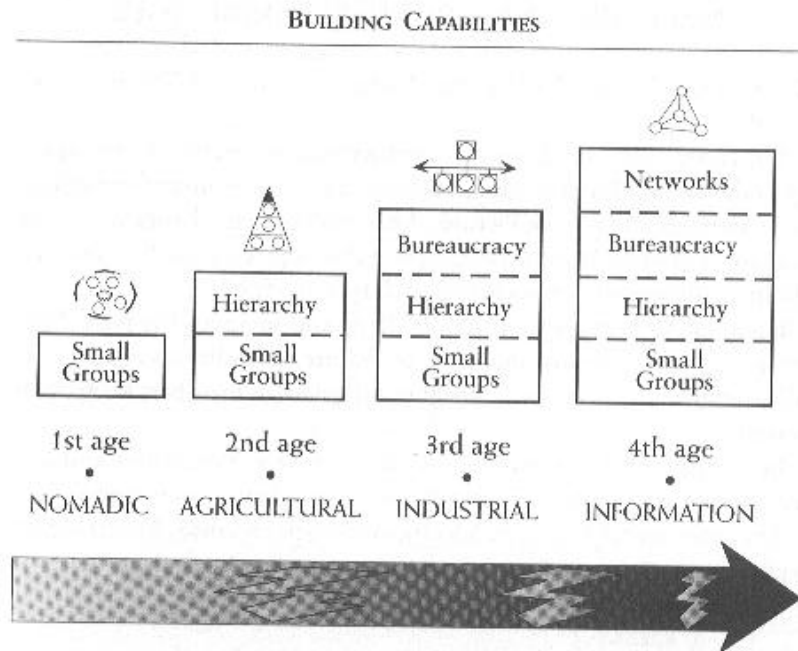
And the beat continued, faster still. Unfortunately, when faced with continuous uncertainty and change, bureaucracy is like kudzu, the vin-elike weed that spreads until it overruns everything and chokes other forms of life. It often creates a new unit to solve a problem, instead of simply connecting people in existing organizations who probably have the answer. Then the "problem" turns into a department.

So a bureaucracy grows, ever bigger, ever slower, until **it** just sits there, failing to innovate or change, placing drag on everything else. Today's complexity outruns bureaucracy's ability to organize it.

"ONLY CONNECT": LINKING IN NETWORKS

In 1993, worldwide Internet (the global system linking tens of thousands of computer networks) traffic grew at an incredible annual rate of 341,634 percent.[2] A new Internet node—home base for another network of people—joined every 10 minutes; a new person signed on every 30 seconds.

A parallel growth in connections is happening in organizations:

alliances are forming at an accelerating rate among firms of all sizes. Services are the economy's growth sector, emphasizing people and process, while manufacturing is shrinking, as agriculture did in the Industrial Age.

BUILDING CAPABILITIES

Connect! It's the organizing imperative of the Age of the Network.

Relationships are the dominant reality in the Information Age. They are displacing the focus on matter, which sits at the center of the Industrial Age world view.

Today we are challenged to cope with continuous global change, which constantly presents us with more opportunities. Links—technological and human—drive the reorganization of work. Bureaucracy began horizontal expansion; the Information Age takes it to mach speed.

NETWORK THE ORGANIZATIONAL AGES

What to save? What to change? Where to continue? When to leap ahead?

The complexity that faces 21st-century business outstrips the capacity of the accumulated wisdom of earlier ages. So we invent something new: networks. In the Big Picture, the overall pace of change drives the next form of organization. With new technology eventually comes the ability to manage in an increasingly larger context.

Each age of organization builds upon and includes the past. Networks in particular are inclusive by nature. Breadth gives them resilience; diversity gives them insight; independent members keep them honest.

In the Age of the Network, we still will have hierarchies and bureaucracies, just as we will continue to have farms and factories.
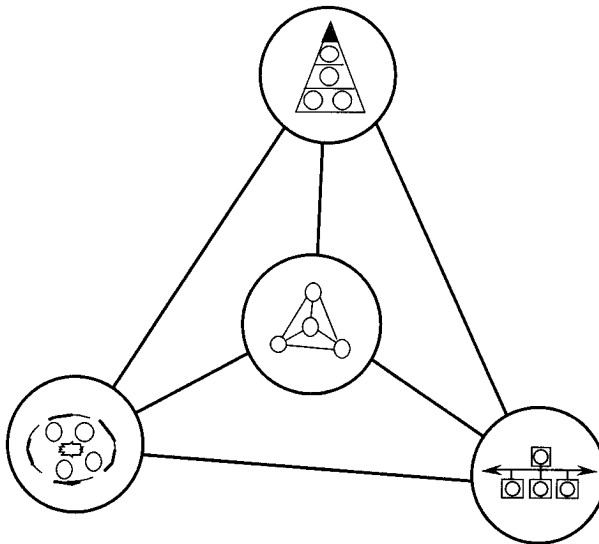
The most literal way networks include earlier forms is by linking all types of organizations.

Members of a network do not themselves have to be networks.

Somerset was the code name for the network that linked Apple, IBM, and Motorola as the three corporate behemoths shared knowledge, talent, and dollars to produce the PowerPC chip. The Strategic Avionics Technology Working Group is the network that links the National Aeronautics and Space Agency (NASA) with its colleagues in industry and the public, as well as with space organizations in other countries, to forge a new vision and working plan for space exploration in the 21st century. Meanwhile, space agencies in the United States, Russia, Japan, and Europe have joined forces in the International Mars Exploration Working Group to "coordinate and work together on future missions to explore the planet Mars."[3]

France, Germany, Spain, and the United Kingdom are bureaucratic partners in Airbus Industrie (whose slogan is "Taking the World

NETWORKS INCLUDE ALL TYPES OF ORGANIZATIONS

View"), the upstart commercial aircraft manufacturer now controlling 30 percent of the global market.[4] When they work together, hierarchies and bureaucracies naturally form networks yet remain independent.

Different departments in a company often use different organizational forms—quite effectively if they are appropriately tuned to the environment and technology. For example, Nike's fast-moving R&D department is caught up in the latest technologies and networks of professional contacts, and its fleet-footed marketing department interacts intensively with outside agencies, the media, and customers. Finance, however, moves more slowly, calculating along with its bureaucratic, number-processing function. A need for reliable, predictable production capacity leads Nike and its competitors to outsource manufacturing to a network of suppliers, many in Southeast Asia, that may use more rigid, mechanistic structures.

At British Petroleum Exploration (BPX), the procurement department performs a much slower bureaucratic function than the fast-moving, networked world of "frontier exploration" in the Far East. So the entire company lives in a familiar paradox. "It was designed and developed in a world where geography mattered, not where process matters," says Dr. Lilly Evans, a computer scientist and former head of Organizational Engineering for BPX.

To repeat: *all the parts of the network do not have to be the same*. The 21st-century organization comprises all types: small groups, hierarchies, bureaucracies, and networks.

NEW WAYS TO MANAGE

Today, regardless of size, most businesses exist in a global context. Asea Brown Boveri, the Swiss-based $30 billion "multidomestic," operates across more than 100 national borders. Unchanged for 100 years, Halewood Pharmacy, once our neighborhood drug store, suddenly found itself competing with CVS, which suppliers feed from all over the world. Big companies and small cope with global markets and change.

The wave of revolutionary changes catches every business scrambling to survive and position itself to prosper as the fundamental rules of the game change—from our small consulting company to a behemoth the size of General Motors to your company (or nonprofit, government agency, school, denomination, or political party). We all are unavoidably in the storm-wracked passage to a new, expansive, information-based economy.

All around us we see glimpses of the future as we explore the frontiers of markets, technologies, and human performance. Trial and error underlie the slowly accumulating knowledge of what works. You can improve your ability to develop more flexible, faster, and smarter responses by tapping into the expanding pool of experience in teamnets.

THE NEW IN THE NOT SO NEW

Fortunately, the old forms of organization as they currently exist will not mire us forever. We do not have to take all that is oppressive about hierarchy and bureaucracy with us as we speed into the Age of the Network. The Information Age reshapes old forms.

We believe that some hierarchical structure is necessary for any complex, multilevel organization. Hierarchies represent ultimate ownership control and decision making and will continue to do so. However, in the Information Age, networked forms of hierarchies also emerge to fulfill these needs.

Two men sit atop KPMG Peat Marwick, the international accounting firm. A triad including Andy Grove ran Intel for many years. A team of six manages Corning, Inc. A five-person "presidency known as the Operations Committee," whose chair rotates annually, runs AT&T.[5] Conrail's Strategic Manager's Group of 25 runs daily operations. Eastman Chemical Company's plant managers share the manufacturing executive function.

Hierarchy itself is becoming more participatory and diverse in the Information Age. More decisions are being pushed down or out, closer to the work and the customer. We must leave behind something

to make this possible—in this case, the narrow, one-way channels of communication and hoarding of information. The nature of control changes with widespread communication and knowledge. Local decision making combines with centralized information sharing in the "network—enabled" hierarchy.

Bureaucracies continue to serve as our legal guardians as specialization remains essential to cope with complexity in the Information Age. Micromanagement, fortunately, will go the way of the dinosaur.

"If the Industrial Revolution gave rise to the gigantic corporate monolith, the Information Revolution will create the 'thousand points of light' of an entrepreneurial culture, where power and creativity are dispersed, decentralized, and democratized," says Bell Atlantic's chairman and CEO, Raymond W. Smith.[6]

Federal Express says that its information system is more valuable than its transportation system. Employees have the power to act at every point of customer contact, supported by a tracking system that is accessible to all. Customers can even get free software from Federal Express to track their own parcels.

> *At FedEx, bureaucracy becomes an enabling*
> *infrastructure rather than a nightmare of bottlenecks.*

Some bureaucracies are being transformed rather than replaced. New relationships erupt spontaneously among the departmental boxes as connections multiply. One spectacular example is NetResults, the collection of people-to-people networks that sprang up among federal agencies working on reinventing government (see chapter 6).

OUT OF SIGHT, OUT OF MIND

For most of human history, people were born, lived, and died within walking distance. By definition, a small working group naturally implied that people were physically together—in the popular jargon, collocated. Relationships depended on personal contact in the flesh. Small groups meant face-to-face interactions.

Suddenly, this is no longer true. Just as relationships and the need for coordination explode, so does the geographic distribution of our coworkers. The people we work with are not necessarily in our building, probably not within walking distance, at least not very often.

Proximity breeds coordination and cooperation. People solve problems, the common wisdom goes, by being together physically. If you need a group of people to do something that demands speed and coordination, you have to bring them together.

Now look at the data. Just how close do you have to be to get the advantages of physical proximity? Pretty close.

According to research begun at MIT in the late 1970s,[7] communication rapidly declines as distance increases. MIT Professor Tom Allen studied engineers with offices next door to one another and found that they had a 25 percent probability of communicating at least once a week. Fewer than 10 percent were likely to communicate each week when 30 feet apart. After about 90 feet apart, they were no more likely to communicate than people who were several miles apart.

Another study in the late 1980s[8] focused on how physical proximity affects collaboration. It found that people on the same corridor collaborate five times as often (10.3 percent) as people simply situated on the same floor (1.9 percent). Collaboration drops off sharply again when people occupy different floors (0.3 percent). Ironically, the study found that people in different buildings collaborate slightly more often (0.4 percent) than people on different floors in the same building. You don't think another floor requires a special trip, yet it has the same "out of sight, out of mind" effect.

Steelcase, Inc., the office furniture company, uses this research as a design principle. The "50-foot rule" is the natural size within which

collocation leads to collaboration. Unless all the people you work with regularly are near one another, you are part of a distributed virtual group. This makes yours a "special needs organization" when it comes to being explicit about communication and collaboration.

Welcome to the world of networked work.

The Information Age dramatically alters space and time. We no longer need to be in the same place to connect. Communications channels and up-to-date information are no longer scarce resources.

Connectivity is exploding, yet face-to-face encounters account for most of our small-group knowledge. Historically, hierarchical authority, in particular, has depended on the power of personal characteristics, the power of the person, the body—the Big Guy with the booming voice and displays of power, as well as power settings, to maintain control.

It's hard to bring physical bearing to bear when you're communicating by e-mail. All the CAPITAL LETTERS and !@*$* characters (denoting indignation and the like) on the computer screen can't compare with someone on a power trip staring you down. Physical qualities and locations are less important in the ephemeral age now unfolding. We are learning new, more horizontally connected, participatory ways of achieving higher levels of small-group performance.

So, alongside the old, the new. Thanks to the field of organization development, we are rediscovering ancient small-group, face-to-face knowledge. At the same time, we're inventing some brand new skills for the geographically spread groups of the 21st century.

ON A PERSONAL LEVEL

We all belong to many different groups simultaneously. Moving from group to group, we can travel through the ages.

A fire fighter can stride through all four ages in a single work day.

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Upstairs over the station house is a small world with a kitchen, rec room, and bunks where the informal small group sleeps, a very placid environment—until the alarm goes off. Then the informal group dons its firefighting gear, snaps into a military unit, and heads for the crisis. After the fire, the fighter puts on a bureaucratic uniform and becomes an inspector to assess the damage and investigate the cause. That night, the uniform comes off and a person with a mission to save lives joins with a network of teachers and other leaders working to prevent fires in the community.

Useful, timeless basic human capabilities recur in each new age. Our life is a mosaic of past and future. Each of us, like the fire fighter, exists simultaneously in all four ages.

The new postindustrial model is *inclusive* of old models, not *replacements* for them.. The laws of motion in everyday life did not grind to a halt when quantum physics overwhelmed Newtonian absolutes at the dawn of the 20th century; the experience of gravity did not change when Einstein discovered relativity.

Each age makes a contribution to the repertoire of human organizations, with older forms gaining new features in later ages. Yet core patterns remain, and our challenge is to know which pattern to apply where.