THE COMING OF THE NEW ORGANIZATION

The typical large business 20 years hence will have fewer than half the levels of management of its counterpart today, and no more than a third of the managers. In its structure, and in its management problems and concerns, it will bear little resemblance to the typical manufacturing company, circa 1950, which our textbooks still consider the norm.

Instead it is far more likely to resemble organizations that neither the practicing manager nor the management scholar pays much attention to today: the hospital, the university, the symphony orchestra. For like them, the typical business will be **knowledge- based**, an organization **composed largely of specialists** who **direct and discipline their own performance** through **organized feedback** from **colleagues, customers, and headquarters**. For this reason, it will be what I call an information- based organization.

Businesses, especially large ones, have little choice but to become information-based.

Demographics, for one, demands the shift. The center of gravity in employment is moving fast from manual and clerical workers to knowledge workers who resist the command-and-control model that business took from the military 100 years ago.

Economics also dictates change, especially the need for large businesses to innovate and to be entrepreneurs.

But above all, **information technology** demands the shift.

Advanced data-processing technology isn't necessary to create an information-based organization, of course.

> As we shall see, the British built just such an organization in India when "information technology meant the quill pen, and barefoot runners were the "telecommunications" systems.

But as advanced technology becomes more and more prevalent, we have to engage in analysis and diagnosis—that is, in "information "—even more intensively or risk being **swamped** by the data we generate.

So far most computer users still use the new technology only to do faster what they have always done before, crunch conventional numbers.

But as soon as a company takes the <u>first</u> <u>tentative</u> <u>steps</u> from data to information, **its decision processes, management structure, and even the way its work gets done** begin to be <u>transformed</u>.

In fact, this is already happening, quite fast, in a number of companies throughout the world.

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We can readily see the first step in this transformation process when we consider the impact of computer technology on capital investment decisions.

We have known for a long time that there is no one right way to analyze a proposed capital investment. To understand it we need at least six analyses:

o   the expected rate of return;

o   the layout period and the investment's expected productive life;

o   thee discounted present value of all returns through the productive lifetime of the investment;

o   the risk in not making the investment or deferring it;

o   the cost and risk in case of failure; and finally,

o   the opportunity cost.

Every accounting student is taught these concepts.

But before the advent of data-processing capacity, the actual analyses would have taken man-years of clerical toil to complete. Now anyone with a spreadsheet should be able to do them in a few hours.

The availability of this information <u>transforms</u> the capital-investment analysis from <u>opinion</u> into <u>diagnosis</u>, that is, into the <u>rational</u> <u>weighing</u> <u>of</u> <u>alternative</u> <u>assumptions</u>. Then the information <u>transforms</u> the capital-investment decision from <u>an</u> <u>opportunistic,</u> <u>financial</u> <u>decision</u> <u>governed</u> <u>by</u> <u>the</u> <u>numbers</u> into a <u>business</u> <u>decision</u> based on the <u>probability</u> <u>of</u> <u>alternative</u> <u>strategic</u> <u>assumptions</u>. So the decision both <u>presupposes</u> a **business strategy** and <u>challenges</u> that strategy and its <u>assumptions</u>. What was once a budget exercise becomes an **analysis of policy**.

The second area that is affected when a company focuses its data-processing capacity on producing information is its **organization structure**.

Almost immediately, it becomes clear that both the number of underline management levels and the number of managers can be **sharply cut**.

The reason is straightforward: it turns out that whole layers of management neither make decisions nor lead. Instead, their main, if not their only, function is to serve as "relays"—human boosters for the faint, unfocused signals that pass for communication in the traditional pre-information organization.

One of America's largest defense contractors made this discovery when it asked what information its top corporate and operating managers needed to do their jobs. Where did it come from? What form was it in? How did it flow?

The search for answers soon revealed that whole layers of management—perhaps as many as 6 out of a total of 14— existed only because these questions had not been asked before.

The company had had data galore. But it had always used its copious data for control rather than for information.

Information is data endowed with relevance and purpose.

Converting data into information thus requires knowledge.

And knowledge, by definition, is specialized. (In fact, truly knowledgeable people tend toward overspecialization, whatever their field, precisely because there is always so much more to know.)

The information -based organization requires **far more specialists** overall than the command-and-control companies we are accustomed to. Moreover, the specialists are **found in operations**, not as corporate headquarters.

Indeed, the operating organization tends to become **an organization of specialists of all kinds**.

Information-based organizations need <u>central</u> <u>operating</u> <u>work</u> such as legal counsel, public relations, and labor relations as much as ever.

But the need for <u>service</u> <u>staffs</u>—that is, for people without operating responsibilities who only advise, counsel, or coordinate shrinks drastically.

In its central management, the information-based organization needs <u>few</u>, <u>if</u> <u>any</u>, <u>specialists</u>.

Because of its flatter structure, the large, information-based organization will more closely resemble the businesses of a century ago than today's big companies.

> Back then, however, all the knowledge, such as it was, lay with the very top people.

> The rest were helpers or hands, who mostly did the same work and did as they were told.

In the information-based organization, <u>the</u> <u>knowledge</u> <u>will</u> <u>be</u> <u>primarily</u> <u>at</u> <u>the</u> <u>bottom</u>, in the minds of the specialists <u>who</u> <u>do</u> <u>different</u> <u>work</u> and <u>direct</u> <u>themselves.</u>

So today's typical organization in which knowledge tends to be concentrated in service staffs, perched rather insecurely between top management and the operating people, will likely be labeled a phase, an attempt to infuse knowledge from the top rather than obtain information from below.

Finally, **a good deal of work will be done differently in the information-based organization**.

<u>Traditional</u> <u>departments</u> will serve as <u>guardians</u> <u>of</u> <u>standards</u>, as centers for training and the assignment of specialists; they won't be where the work gets done. That will happen largely in <u>task-focused</u> <u>teams</u>.

This change is already under way in what used to be the most clearly defined of all departments research. In pharmaceuticals, in telecommunications, in papermaking, the traditional sequence of research, development, manufacturing, and marketing is being replaced by synchrony: specialists from all these functions work together as a team, from the inception of research to a product's establishment in the market.

How task forces will develop to tackle other business opportunities and problems remains to be seen. I suspect, however, that the need for a task force, its assignment, its composition, and its leadership will have to be decided on case by case. So the organization that will be developed will go beyond the matrix and may indeed be quite different from it. One thing is clear, though: it will require greater self-discipline and even greater emphasis on individual responsibility for relationships and for communications.

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To say that information technology is transforming business enterprises is simple.

What this transformation will require of companies and top managements is much harder to decipher.

That is why I find it helpful to look for clues in other kinds or information-based organizations, such as the hospital, the symphony orchestra, and the British administration in India.

A **fair- sized hospital** of about 400 beds will have a staff of several hundred physicians and 1,200 to 1,500 paramedics divided among some 60 medical and paramedical specialties. Each specialty has its own knowledge, its own training, its own language. In each specialty, especially the paramedical ones like the clinical lab and physical therapy, there is a head person who is a working specialist rather than a full-time manager. The head of each specialty reports directly to the top, and there is little middle management. A good deal of the work is done in ad hoc teams as required by an individual patient's diagnosis and condition.

A large **symphony orchestra** is even <u>more</u> <u>instructive</u>, since for some works there may be a few hundred musicians on stage playing together. According to organization theory then, there should be several group vice president conductors and perhaps a half-dozen division VP conductors. But that's not how it works. There is only the conductor— CEO—and every one of the musicians plays directly to that person without an intermediary. And each is a high-grade specialist, indeed an artist.

But the best example of a large and successful information-based organization, and one without any middle management at all, is the **British civil administration in India**.

The British ran the Indian subcontinent for 200 years, from the middle of the eighteenth century through World War II, without making any fundamental changes in organization structure or administrative policy.

The Indian civil service never had more than 1,000 members to administer the vast and densely populated subcontinent—a tiny fraction (at most 1 percent) of the legions of Confucian mandarins and palace eunuchs employed next door to administer a not-much-more populous China. Most of the Britishers were quite young; a 30-year-old was a survivor, especially in the early years. Most lived alone in isolated outposts with the nearest countryman a day or two of travel away, and for the first hundred years there was no telegraph or railroad.

The organization structure was totally flat. Each district officer reported directly to the "Coo," the provincial political secretary. And since there were nine provinces, each political secretary had at least 100 people reporting directly to him, many times what the doctrine of the span of control would allow. Nevertheless, the system worked remarkably well, in large part because it was designed to ensure that <u>each</u> <u>of</u> <u>its</u> <u>members</u> <u>had</u> <u>the</u> <u>information</u> <u>he</u> <u>needed</u> <u>to</u> <u>do</u> <u>his job</u>.

> Each month the district officer spent a whole day writing a full report to the political secretary in the provincial capital.

> He discussed each of his principal tasks—there were only four, each clearly delineated.

> He put down in detail what he had expected would happen with respect to each of them, what actually did happen, and why, if there was a discrepancy, the two differed.

> Then he wrote down what he expected would happen in the ensuing month with respect to each key task and what he was going to do about it, asked questions about policy, and commented on long-term opportunities, threats, and needs.

> In turn, the political secretary "minuted" every one of those reports—that is, he wrote back a full comment.

On the basis of these examples, what can we say about the requirements of the information-based organization? And what are its management problems likely to be?

Let's look first at the requirements.

Several hundred musicians and their CEO, the conductor, can play together because they all have the **same score**. It tells both flutist and timpanist what to play and when. And it tells the conductor what to expect from each and when. Similarly, all the specialists in the hospital share a common mission: the care and cure of the sick. The diagnosis is their "score"; it dictates specific action for the X-ray lab, the dietitian, the physical therapist, and the rest of the medical team.

Information-based organizations, in other words, **require clear, simple, common objectives** that **translate into particular actions**. At the same time, however, as these examples indicate, information-based organizations also need **concentration on one objective or, at most, on a few**.

Because the "players" in an information-based organization are specialists, they **cannot be told how to do their work**. There are probably few orchestra conductors who could coax even one note out of it French horn, let alone show the horn player how to do it.

But the conductor can focus the horn players skill and knowledge on the musicians' joint performance. And this focus is what the leaders of an information-based business must be able to achieve.

Yet a business has no "score" to play by except the score it writes as it plays. And whereas neither a first-rate performance of a symphony nor a miserable one will change what the composer wrote, the performance of a business continually <u>creates</u> <u>new</u> <u>and</u> <u>different</u> <u>scores</u> against which its performance is assessed. So an information-based business must be structured around <u>goals</u> that clearly state <u>management's</u> <u>performance</u> <u>expectations</u> for the enterprise and for <u>each</u> <u>part</u> and <u>specialist</u> and <u>around</u> <u>organized</u> <u>feedback</u> <u>that</u> <u>compares</u> <u>results</u> <u>with</u> <u>these</u> <u>performance</u> <u>expectations</u> <u>so</u> <u>that</u> <u>every</u> <u>member</u> <u>can</u> <u>exercise</u> <u>self-control</u>.

The other requirement of an information-based organization is that **everyone take information responsibility**. The bassoonist in the orchestra does so every time she plays a note. Doctors and paramedics work with in elaborate system of reports and an information center,

the nurse's station on the patient's floor. The district officer in India acted on this responsibility every time he riled a report.

The key to such a system is that everyone asks: Who in this organization depends on me for what, information? And on whom, in turn, do I depend? Each person's list will always include superiors and subordinates. But the most important names on it will be those of colleagues, people with whom one's primary relationship is coordination. The relationship of the internist, the surgeon, and the anesthesiologist is one example. But the relationship of a biochemist, a pharmacologist, the medical director in charge of clinical testing, and a marketing specialist in a pharmaceutical company is no different. It, too, requires each party to take the fullest information responsibility.

Information responsibility to others is increasingly understood, especially in middle-sized companies. But information responsibility to oneself is still largely neglected. That is, everyone in an organization should constantly be thinking through what information he or she needs to do the job and to make a contribution.

> This may well be the most radical break with the way even the most highly computerized businesses are still being run today. There, people either assume the more data, the more information which was a perfectly valid assumption yesterday when data were scarce, but leads to data overload and information blackout now that they are plentiful. Or they believe that information specialists know what data executives and professionals need in order to have information. But information specialists are tool makers. They can tell us what tool to use to hammer upholstery nails into a chair. We need to decide whether we should be upholstering a chair at all.

Executives and professional specialists need to think through what information is for them, what data they need: first, to know what they are doing; then, to be able to decide what they should be doing; and finally, to appraise how well they are doing. Until this happens MIS departments are likely to remain cost centers rather than become the result centers they could be.

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Most large businesses have little in common with the examples we have been looking at. Yet to remain competitive—maybe even to survive— they will have to convert themselves into information-based organizations, and fairly quickly. They will have to change old habits

and acquire new ones. And the more successful a company has been, the more difficult and painful this process is apt to be. It will **threaten** the jobs, status, and opportunities of a good many people in the organization, especially the long-serving, middle-aged people in middle management who tend to be the least mobile and to feel most secure in their work, their positions, their relationships, and their behavior.

The information-based organization will also pose its own special management **problems**. I see as particularly critical:

> 1. Developing rewards, recognition, and career opportunities for specialists.

> 2. Creating unified vision in an organization of specialists.

> 3. Devising the management structure for an organization of task forces.

> 4. Ensuring the supply, preparation, and testing of top management people.

Bassoonists presumably neither want nor expect to be anything but bassoonists. Their career opportunities consist of moving from second bassoon to first bassoon and perhaps of moving from a second-rank orchestra to a better, more prestigious one. Similarly, many medical technologists neither expect nor want to be anything but medical technologists. Their career opportunities consist of a fairly good chance of moving tip to senior technician, and a very slim chance of becoming lab director. For those who make it to lab director, about I out of every 25 or 30 technicians, there is also the opportunity to move to a bigger, richer hospital. The district officer in India had practically no chance for professional growth except possibly to be relocated, after a three-year stint, to a bigger district.

Opportunities for specialists in an information -based business organization should be more plentiful than they are in an orchestra or hospital, let alone in the Indian civil service. But as in these organizations, they will primarily be opportunities for advancement within the specialty, and for limited advancement at that. Advancement into "management" will be the exception, for the simple reason that there will be far fewer middle-management positions to move into. This contrasts sharply with the traditional organization where, except in the research lab, the main line of advancement in rank is out of the specialty and into general management.

More than 30 years ago General Electric tackled this problem by creating "parallel opportunities" for "individual professional contributors" Many companies have followed this example. But professional specialists themselves have largely rejected it as a solution. To them—and to their management colleagues—the only meaningful opportunities are promotions into management. And the prevailing compensation structure in practically all businesses reinforces this attitude because it is heavily biased towards managerial positions and titles.

There are no easy answers to this problem. Some help may come from looking at large law and consulting firms, where even the most senior partners tend to be specialists, and associates who will not make partner are outplaced fairly early on. But whatever scheme is eventually developed will work only if the values and compensation Structure of business are drastically changed.

The **second challenge** that management faces is giving its organization of specialists a common vision, a view of the whole.

In the Indian civil service, the district officer was expected to see the "whole" of his district. But to enable him to concentrate on it, the government services that arose one after the other in the nineteenth century (forestry, irrigation, the archaeological survey, public health and sanitation, roads) were organized outside the administrative structure, and had virtually no contact with the district officer. This meant that the district officer became increasingly isolated from the activities that often had the greatest impact on—and the greatest importance for—his district. In the end, only the provincial government or the central government in Delhi had a view of the "whole," and it was an increasingly abstract one at that.

A business simply cannot function this way. It needs a view of the whole and a focus on the whole to be shared among a great many of its professional specialists, certainly among the senior ones. And yet it will have to accept, indeed will have to foster, the pride and professionalism of its specialists—if only because, in the absence of opportunities to move into middle management, their motivation must come from that pride and professionalism.

One way to foster professionalism, of course, is through assignments to task forces. And the information-based business will use more and more smaller self-governing units, assigning them tasks tidy enough for

"a good man to get his arms around," as the old phrase has it. But <u>to what extent should information based businesses rotate performing specialists out of their specialties and into new ones</u>? And <u>to what extent will top management have to accept as its top priority making and maintaining a common vision across professional specialties</u>?

Heavy reliance on task-force teams assuages one problem. But it aggravates another: **the management structure of the information-based organization.**

Who will the business's managers be? Will they be taskforce leaders? Or Will there be a two-headed monster—a specialist structure, comparable, perhaps, to the way attending physicians function in a hospital, and an administrative structure of task-force leaders?

The decisions we face on the role and function of the task-force leaders are risky and controversial.

Is theirs a permanent assignment, analogous to the job of the supervisory nurse in the hospital? Or is it a function or the task that changes as the task does? Is it an assignment or a position? Does it carry any rank at all? And if it does, will the task-force leaders become in time what the product managers have been at Procter & Gamble: the basic units of management and the company's field officers? Might the task-force leaders eventually replace department heads and vice presidents?

Signs of every one of these developments exist, but there is neither a clear trend nor much understanding as to what each entails. Yet each would give rise to <u>a different organizational structure from any we are familiar with</u>.

Finally, <u>the toughest problem</u> will probably be to **ensure the supply, preparation, and testing of top management people**. This is, of course, an old and central dilemma its well as a major reason for the general acceptance of decentralization in large businesses in the last 40 years. But the existing business organization has a great many middle-management positions that are supposed to prepare and test a person. As a result, there are usually a good many people to choose from when filling a senior management slot. With the <u>number of middle-management positions sharply cut</u>, where will the information-based organization's top executives come from? What will be their preparation? How will they have been tested?

Decentralization into autonomous units will surely be even more critical than it is now. Perhaps we will even copy the German Gruppe in which the decentralized units are set up as separate companies with their own top managements. The Germans use this model precisely because of their tradition of promoting people in their specialties, especially in research and engineering; if they did not have available commands in near-independent subsidiaries to put people in, they would have little opportunity to train and test their most promising professionals. These subsidiaries are thus somewhat like the farm teams of a major-league baseball club.

We may also find that more and more top management jobs in big companies are filled by hiring people away from smaller companies. This is the way that major orchestras get their conductors—a young conductor earns his or her spurs in it small orchestra or opera house, only to be hired away by it larger one. And the heads of a good many large hospitals have had similar careers.

Can business follow the example of the orchestra and hospital where top management has become a separate career? Conductors and hospital administrators come out of courses in conducting or schools of hospital administration respectively. We see something of this sort in France, where large companies are often run by men who have spent their entire previous careers in government service. But in most countries this would be unacceptable to the organization (only France has the mystique of the grandes écoles). And even in France, businesses, especially large ones, are becoming too demanding to be run by people without firsthand experience and a proven success record.

Thus the entire top management process—preparation, testing, succession—will become even more problematic than it already is. There will be a growing need for experienced business-people to go back to school. And **business schools** will surely need to work out what successful professional specialists must know to prepare themselves for high-level positions as business executives and business leaders.

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Since modern business enterprise first arose, after the Civil War in the United States and the Franco-Prussian War in Europe, there have been **two major evolutions in the concept and structure of organizations**. The first took place in the ten years between 1895 and 1905. It distinguished management from ownership and established management

as work and task in its own right. This happened first in Germany, when Georg Siemens, the founder and head of Germany's premier bank, Deutsche Bank, saved the electrical apparatus company his cousin Werner had founded after Werner's sons and heirs had mismanaged it into near collapse. By threatening to cut off the bank's loans, he forced his cousins to turn the company's management over to professionals. A little later, J. P. Morgan, Andrew Carnegie, and John D. Rockefeller, Sr. followed suit in their massive restructurings of U.S. railroads and industries.

The second evolutionary change took place 20 years later. The development of what we still see as the modern corporation began with Pierre S. du Pont's restructuring of his family company in the early twenties and continued with Alfred P. Sloan's redesign of General Motors a few years later. This introduced the command-and-control organization of today, with its emphasis on decentralization, central service staffs, personnel management, the whole apparatus of budgets and controls, and the important distinction between policy and operations. This stage culminated in the massive reorganization of General Electric in the early 1950s, an action that perfected the model most big businesses around the world (including Japanese organizations) still follow.

Now we are entering a third period of change: the shift from the command-and-control organization, the organization of departments and divisions, to the information-based organization, the organization of knowledge specialists. We can perceive, though perhaps only dimly, what this organization will look like. We can identify some of its main characteristics and requirements. We can point to central problems of values, structure, and behavior. But the job of actually building the information-based organization is **still ahead of us**—it is **the managerial challenge of the future**.