請從下面的兩套文獻中擇一閱讀，並請依指示回答問題。第一套中只有一篇論文；第二套中有四篇文章，四篇都要看完。

1. "Empowerment: The emperor's new clothes" by Chris Argyris, 1998, Harvard Business Review, May-June, Pp.98-105.

請回答下列問題：

(1) 請說明你認為 Argyris 所指稱的賦權 (empowerment) 的真正內涵究竟是什麼？

(2) 組織在實行賦權活動時，會遭遇到何種問題？

(3) 員工和經理人要有何種的心理準備才能使組織賦權真正落實？

2. From The Best of the Manager's Journal, edited by David Asman and Adam Meyerson, 1985, Dow Jones-Irwin, Homewood.

請回答下列問題：

(1) 請分別敘述四篇文章的大意。簡單說明你同意或不同意他們看法的理由。

(2) 第一篇與第二篇有何異同？

(3) 第二篇與第四篇有何異同？

(4) 你對這四位作者有何了解？

第一套 2.

Despite all the talk and the change programs, empowerment is still mostly an illusion.

EMPOWERMENT: THE EMPEROR'S NEW CLOTHES

BY CHRIS ARGYRIS

CONSIDERING its much touted potential, it's no wonder that empowerment receives all the attention it does. Who wouldn't want more highly motivated employees to help scale the twenty-first century? As one CEO has said, "No vision, no strategy can be achieved without able and empowered employees."

Top-level executives accept their responsibilities to try to develop empowered employees. Human resource professionals devise impressive theories of internal motivation. Experts teach change management. Executives themselves launch any number of programs from reengineering to continuous improvement to TQM. But little of it works.[1]

Take reengineering for instance. Although the rhetoric of reengineering is consistent with empowerment, in reality it is anything but that. Both research and practice indicate that the best results of reengineering occur when jobs are rigorously specified and not when individuals are left to define them. Even the GE workout sessions had their greatest success when the problems resolved were relatively routine. Reengineering has led to improvements in performance, but it has not produced the number of highly motivated employees needed to ensure consistently high-performing organizations.

Few executives would deny that there has been little growth in empowerment over the last 30 years. But why that is so remains a riddle. The answer is complex. The change programs and practices we employ are full of inner contradictions that cripple innovation, motivation, and drive. At the same time, CEOs subtly undermine empowerment. Managers love empowerment in theory, but the command-and-control model is what they trust and know best. For their part, employees are often ambivalent about empowerment – it is great as long as they are not held personally accountable. Even the change professionals often stifle empowerment. Thus, despite all the best efforts that have gone into fostering empowerment, it remains very

much like the emperor's new clothes: we praise it loudly in public and ask ourselves privately why we can't see it. There has been no transformation in the workforce, and there has been no sweeping metamorphosis.

Two Kinds of Commitment

To understand why there has been no transformation, we need to begin with commitment. Commitment is not simply a human relations concept. It is an idea that is fundamental to our thinking about economics, strategy, financial governance, information technology, and operations. Commitment is about generating human energy and activating the human mind. Without it, the implementation of any new initiative or idea would be seriously compromised. Human beings can commit themselves in two fundamentally different ways: externally and internally. Both are valuable in the workplace, but only internal commitment reinforces empowerment. (See the exhibit "How Commitment Differs.")

External commitment – think of it as contractual compliance – is what an organization gets when workers have little control over their destinies. It is a fundamental truth of human nature and psychology that the less power people have to shape their lives, the less commitment they will have. When, for example, management single-handedly defines work conditions for employees, the employees will almost certainly be externally committed. That commitment is external because all that is left for employees is to do what is expected of them. The

Chris Argyris is the James Bryant Conant Professor Emeritus of Education and Organizational Behavior at Harvard University in Cambridge, Massachusetts. He is the author of "Good Communication That Blocks Learning" (HBR July–August 1994), a McKinsey Award winner. He is also a director at Monitor Company in Cambridge.

ARTWORK BY BRYAN LEISTER

HOW COMMITMENT DIFFERS

External Commitment	Internal Commitment
Tasks are defined by others.	Individuals define tasks.
The behavior required to perform tasks is defined by others.	Individuals define the behavior required to perform tasks.
Performance goals are defined by management.	Management and individuals jointly define performance goals that are challenging for the individual.
The importance of the goal is defined by others.	Individuals define the importance of the goal.

employees will not feel responsible for the way the situation itself is defined. How can they? They did not do the defining.

If management wants employees to take more responsibility for their own destiny, it must encourage the development of *internal commitment*. As the name implies, internal commitment comes largely from within. Individuals are committed to a particular project, person, or program based on their own reasons or motivations. By definition, internal commitment is participatory and very closely allied with empowerment. The more that top management wants internal commitment from its employees, the more it must try to involve employees in defining work objectives, specifying how to achieve them, and setting stretch targets.

We might well ask whether everyone must participate in order for empowerment to exist in an organization. In principle, the answer is "yes"; in reality, there is a "but." It is unrealistic to expect management to allow thousands of employees to participate fully in self-governance. The degree to which internal commitment is plausible in any organization is certainly limited. Moreover, the extent of participation in corporate goals and aspirations will vary with each employee's wishes and intentions.

At SmithKline Beecham, in one of the most far-reaching programs for employee participation that I know of, management used a merger as an opportunity to build empowerment. Throughout the entire organization, more than 400 task forces were created. Yet to this day top management does not believe that internal commitment has been generated throughout the entire company. Their realistic assessment is that not even all the employees on the task forces feel empowered.

To be fair, it is important to remember that empowerment is a goal that organizations approximate but never quite reach. The fact is that it is possible to have various levels of commitment in an organization and still get the job done. Curiously, employees have no trouble understanding the need to keep within bounds. In all my work, I have yet to find employees who make unrealistic demands about empowerment. For top management, then, the essential thing to know is that there are limits to internal commitment. Employees do not understand – in fact, they usually resent – executives preaching internal commitment while continuing to demand external commitment from the rank and file. Indeed, a great source of discontent in organizations is that top-level managers continually risk their credibility by espousing empowerment too glibly.

Clearly, if it is internal commitment that provides the kind of outcomes that CEOs say they want, then they must be realistic and judicious in their demands for it. But the problem goes deeper because the framework that most organizations are now using to transform themselves discourages employees from actually taking responsibility in their jobs.

Change Programs Increase Inner Contradictions

Major change programs are rife with inner contradictions. By this, I mean that even when these programs and policies are implemented correctly, they do not – and cannot – foster the behavior they are meant to inspire. If the inner contradictions are brought to the surface and addressed, they can be dealt with successfully; that is, they will not inhibit the kind of personal commitment that management says it wants. But if the contradictions remain buried and unacknowledged, as they usually do, they become a destructive force. Not only do they stifle the development of empowerment, they also sap the organization's efficiency by breeding frustration and mistrust.

To illustrate, consider the advice that currently represents best practice for implementing and promoting organizational change. That advice breaks the process down into four basic steps:

- Define a *vision.*
- Define a competitive *strategy* consistent with the vision.
- Define organizational *work processes* that, when executed, will implement the strategy.
- Define individual *job requirements* so that employees can carry out the processes effectively.

The underlying pattern of these instructions is consistent with what change researchers and practitioners have learned about effective implementation over the years. Start with a clear framework – a vision – and progressively make it operational so that it will come alive. So that no one will have any doubts about how to align the four parts of the process, management is advised to speak with one voice. This process makes sense. It is rational.

Yet the process is so riddled with inner contradictions that change programs that follow it will only end up creating confusion, *particularly at the implementation stage. Given that all* *e steps have been so precisely described through a* *of instructions,* the advice actually encourages re external than internal commitment. Clearly, n employees' actions are defined almost exclu ly from the outside (as they are in most change grams), the resulting behavior cannot be em ering and liberating. One immediate consequence is that employees react to the change program by quietly distancing themselves from it. Thus the change program is successful in terms of improving performance because it helps reduce mistakes, as in the case of TQM, or because it helps employees embrace best practices. But at the same time, it undermines internal commitment. In short, the advice for implementing change simply does not provide the new source of energy that many executives want.

But the real danger is that change programs end up poisoning the entire corporation with long-lasting mixed messages. Internally committed employees interpret these messages as "do your own thing – the way we tell you." They reluctantly toe the line. Employees who prefer external commitment will also pick up the mixed messages; however, these people will be relieved because they feel protected from having to take any personal responsibility. In this way, the very working habits that executives do not want to see continued in their organizations are strengthened and reinforced. The result is invariably more inner contradictions and more inefficiency and cynicism, all of which get in the way of real change.

CEOs Undermine Empowerment

CEOs work against empowerment both consciously and unconsciously. Surprisingly – at least to outsiders – executives do not always seem to want what they say they need. Consider a few typical remarks that I came across during my research. These remarks – excerpted from a roundtable discussion of executives from world-class companies – *indicate very clearly the ambivalence of CEOs toward internal commitment and empowerment. The first* CEO noted that with "well-defined processes where the variances are small and the operating limits are well defined," you no longer need the old command-and-control approach. Workers are now empowered, "provided they respect the process," he said. The second CEO agreed that these "processes are liberating," while the third observed

> CEOs work against empowerment consciously and unconsciously; executives do not always seem to want what they say they need.

that many employees have a tough time understanding what it means for processes to be "reliable, respectable, and in control."

Let us stop a moment and ask ourselves how there can be empowerment when there is neither guesswork nor challenges – when the job requirements are predetermined and the processes are controlled. For employees operating in such a world, the environment is not empowering; it is foolproof.

Employees won't feel internally committed if someone is always controlling them from the top down.

This is not a milieu in which individuals can aspire to self-governance. On the contrary, as long as they buy in and follow the dictates of the processes, the employees in the companies just described will only become more externally motivated.

The enthusiastic use of champions in virtually all contemporary change programs sends a similar mixed message from CEOs to employees. Top management is well aware of the dangers of piecemeal implementation and eventual fade-out in major change programs. They strive to overcome those problems by anointing champions. The champions pursue performance objectives with tenacity, managing by decree. They have generous resources available to ensure compliance, and they monitor employees' progress frequently. Altogether, these behaviors reinforce the top-down control features of the external commitment model. The single voice of fervent champions leads employees to feel that management is in control, and it drives out the sense of internal responsibility and personal empowerment. How can employees feel empowered if someone is always "selling" them or controlling them from the top down? Indeed, such champions would not be necessary if employees were internally committed.

The result of all these interventions is disarray. Managers and the change programs they use undermine the empowerment they so desperately want to achieve. Why does this occur? Could it be that today's top-level managers don't truly want empowered employees? In truth, they are probably unsure. At the same time, employees do not hold executives to task for their behavior. Employees have their own mixed feelings about empowerment.

Employees Have Their Doubts

External commitment is a psychological survival mechanism for many employees – it is a form of adaptive behavior that allows individuals to get by in most work environments. How that survival mechanism works is illustrated quite dramatically today in the former East Germany.

When the Berlin Wall came down, a routine way of life for East German workers came to an end. Most workers had learned to survive by complying. For 40 years, most plants were run in accordance with the dictates of central planners. If many East Germans had pushed for greater control over their destinies, their lives might have been endangered. As a result, East German workers over the years learned to define performance as doing the minimum of what was required of them.

After the fall of communism, I participated in many discussions with West German executives who were surprised and baffled by the lack of initiative and aspiration displayed by the East Germans. What those executives failed to understand is how bewildering – indeed, how threatening – it can be for people to take internal commitment seriously, especially those who have lived their entire lives by the rules of external commitment. As I listened to the West German executives who wanted to make East German employees more internally committed, I thought of several cases in the United States and elsewhere where similar problems exist. Again and again in my experience, prolonged external commitment made internal commitment extremely unlikely, because a sense of empowerment is not innate. It is something that must be learned, developed, and honed.

The question, then, is, How do you produce internal commitment? One thing for sure is that the incentive programs executives have used – for instance, higher compensation, better career paths, "employee of the month" recognition awards – simply do not work. On the contrary, in all my years as a change consultant, I have repeatedly witnessed how offering employees the "right" rewards creates dependency rather than empowerment. Inevitably, the power of such methods wears off with use, and all that has been created is more external commitment.

Consider one company with substantial financial woes. In that case, the CEO decided at considerable personal sacrifice to raise his employees' salaries. But his own research later showed that the employees merely considered their raises to be in keeping with their equity in the labor market. Internal commitment had not increased. Employees continued to do only what was asked of them as long as the rewards were increased. They followed the rules, but they did not take any initiative. They did not take risks, nor did they show the sense of personal responsibility that management sought. The CEO was surprised, but I thought that these results were entirely predictable for two reasons. First, pay, like other popular incentive schemes, often advances external commitment while creating a bias against internal commitment. Second, and more fundamental, many employees do not embrace the idea of empowerment with any more gusto than management does. For a lot of people, empowerment is just too much work. Like the workers in East Germany, almost all employees have learned to survive by depending on external commitment.

When it comes to empowerment, executives and employees are engaged in shadowboxing. Management says it wants employees who participate more; employees say they want to be more involved. But it is difficult to know who means what. Is it just a charade? Employees push for greater autonomy; management says the right thing but tries to keep control through information systems, processes, and tools. Employees see vestiges of the old command-and-control model as confirming their worse suspicions – that superiors want unchallenged power. Management just wants to see better numbers. Thus the battle between autonomy and control rages on, and meanwhile, as companies make the transition into the next century, the potential for real empowerment is squandered.

Change Professionals Inhibit Empowerment

During the past decade, I have had the opportunity to work with more than 300 change experts in different organizations. Such individuals differ in their practices and their effectiveness, of course, but more striking than the differences are the patterns that recur.

Caught in the middle of the battle between autonomy and control, the change professional has a tough assignment. The role of the change professional, whether internal or external, is ostensibly to facilitate organizational change and continuous learning. In their own way, however, the vast majority of change professionals actually inhibit empowerment in organizations.

To understand how that occurs, consider what happens as Tom, a change agent, tries to work with Jack, a line manager. (Both are composite figures typical of those I encountered in my research.) Jack is told by his boss to work with Tom, who is there to "help" Jack empower his organization. The change program begins with a series of meetings and discussions. Tom talks passionately about openness, honesty, and trust as the foundations of empowerment. Many employees leave these meetings feeling hopeful about the direction that the company is taking toward more open communication. A month into the program, however, Tom observes that Jack has fallen back into his old style of management. He decides that he had better confront Jack:

Tom's unspoken thoughts:	**What Tom and Jack say:**
TOM: *Things aren't going well.*	TOM: So how's everything going?
	JACK: Things are going pretty well. There's a lot of pressure from above, but we're meeting the numbers.

TOM: *Oh great. All Jack cares about is the numbers. Empowerment isn't even on his agenda.*	TOM: Great. Super. But I was also wondering how well we're doing at getting people more committed to their jobs. How empowered do you think people feel?
	JACK: Well, I think we're doing okay. If there are problems, people come to me and we work it out. Sure, some people are never satisfied. But that's just a few people, and we can handle them.
TOM: *Just what I feared. Jack's not "walking the talk." He just doesn't get it at all.*	TOM: Look, Jack, if you solve all their problems, how are we going to empower our employees?
TOM: *This is hopeless! There's got to be an easier way to make a living. I'll never get through to him. I wish I could tell Jack what I think, but I don't want to put him on the defensive. I've got to stay cool.*	
	JACK: Well, to be honest with you, Tom, the signal I'm getting from above is that my job is to produce the numbers without, you know, upsetting people. To be fair, I think I'm doing that.

What's happening here? The change program that began with great enthusiasm is clearly in deep trouble. It's a pattern I've observed over and over again. After the initial excitement passes, reality inevitably settles in. Put aside the nice rhetoric of empowerment, employees *will* have problems. They *will* ask their managers for help, and their managers *will* tell them what to do. That is how most work gets done and how organizations meet their numbers. And in many cases, there's absolutely nothing wrong with this, except that it goes against the theory of empowerment.

What does Tom do when he observes Jack telling his employees what to do? Instead of figuring out whether Jack is doing the right thing in this situation, change experts like Tom will almost always be dismayed, because the managers aren't walking the talk of empowerment. Rarely have I seen a change professional help a manager deal effectively with being caught between a rock and a hard place. Even more uncommon is a change agent who offers practical advice to the manager about what to do.

Not only is Tom unwilling to acknowledge the real problem Jack *is* having, but he papers over his own thoughts. He tries to act as if he still believes the program can be successful when, in *fact*, he has given up hope. Tom himself is guilty of not walking the talk of openness, honesty, and trust.

In my experience, line managers are far more willing to acknowledge the inner contradictions of change programs – at least, in private. They will admit to distancing themselves from the soft stuff – two-way participation, internal commitment, and discontinuous thinking – to focus instead on the numbers. Managers like Jack often conclude – rightly, I'm afraid – that the change agent does not know how to help them. So Jack listens politely as Tom warns him about the dangers of backsliding and exhorts him to be more persistent. And then Jack goes on about his business.

In the end, everyone is frustrated. In theory, empowerment should make it easier for organizations to meet their numbers. But when change programs are imposed without recognizing the limitations of empowerment and when managers and employees are not helped to deal effectively and openly with them, the organization ends up worse off than it was to begin with. Empowerment too often enters the realm of political correctness, which means that no one can say what he or she is thinking: this is just nonsense. In this scenario, if you challenge the change agent, you become an enemy of change.

So instead of feeling more empowered, people throughout the organization feel more trapped and less able to talk openly about what's really going on. Is it any wonder that change programs don't succeed and that they actually undermine the credibility of top management?

What Is to Be Done?

Despite all the rhetoric surrounding transformation and major change programs, the reality is that today's managers have not yet encountered change programs that work. As we have seen, the reasons for that are complex. Although managers share some of the responsibility for undermining internal motivation in their organizations, the change programs that could create high levels of internal commitment and empowerment in corporations do not yet exist. That is why I believe it is time to begin the research and experimentation that is required to find some viable answers. But for now, let me begin with some recommendations that may help executives think more sensibly about empowerment.

- Recognize that every company has both top-down controls and programs that empower people, and that some inconsistencies are inevitable and must simply be managed. When these inner contradictions become apparent, encourage individuals to bring them to the surface; otherwise, a credibility gap will be created that can pollute the organization for many years to come.
- Don't undertake blatantly contradictory programs. For instance, stop creating change programs that are intended to expand internal commitment but are designed in ways that produce external commitment. Make sure that what is being espoused will not contradict what actually happens.
- Understand that empowerment has its limits. Know how much can be created and what can be accomplished. Know that empowerment is not a cure-all. Do not evoke it needlessly. Once it has been created, do not misuse it. Be clear about who has the right to change things. Specify the likely limits of permissible change.
- Realize that external and internal commitment can coexist in organizations but that how they do so is crucial to the ultimate success or failure of empowerment in the organization. For instance, external commitment is all it takes for performance in most routine jobs. Unnecessary attempts to increase empowerment only end up creating downward spirals of cynicism, disillusionment, and inefficiencies. As a first precaution, distinguish between jobs that require internal commitment and those that do not.
- Establish working conditions to increase empowerment in the organization. If you want to help individuals move away from external commitment, encourage them to examine their own behavior. It has been my experience that many employees are willing to become more personally committed if management is really sincere, if the work allows it, and if the rewards reinforce it.
- Calculate factors such as morale, satisfaction, and even commitment into your human relations policies, but do not make them the ultimate criteria. They are penultimate. The ultimate goal is performance. Individuals can be excellent performers and report low morale, yet it is performance and not morale that is paramount. When morale, satisfaction, and sense of empowerment are used as the ultimate criteria for success in organizations, they cover up many of the problems that organizations must overcome in the twenty-first century.
- Help employees understand the choices they make about their own level of commitment. One of the most helpful things we can do in organizations – indeed, in life – is to require that human beings not knowingly kid themselves about their effectiveness.

Empowerment too often enters the realm of political correctness, which means that no one can say what he or she is thinking.

Finally, remember that empowerment can run contrary to human nature, and be realistic about how to achieve and use it. To paraphrase Abraham Lincoln: You can empower all of the people some of the time and some of the people all of the time, but you can't empower all of the people all of the time. In the last analysis, nobody should expect more than that.

1. For a description of the similarities and differences in employee-involvement, reengineering, and TQM programs, see Susan Alberts Mohrman, J.R. Galbraith, and Edward E. Alwatt, *Tomorrow's Organization* (San Francisco: Jossey-Bass, 1998); J. Hendry, "Processing Reengineering and the Dynamic Balance of the Organization," *European Management Journal*, vol. 13, no. 1, pp. 52–57; T. Eccles, "The Deceptive Allure of Empowerment," *Long Range Planning*, vol. 26, no. 6, pp. 13–21; and B.C. Jackson, "Reengineering the Sense of Self: The Managers and the Management Gurus," *Journal of Management Studies*, 1996, vol. 33, no. 5, pp. 571–590.

Reprint 98302

To order reprints, see the last page of this issue.

Streamlining the Factory With Just-in-Time Production

By Richard J. Schonberger

The just-in-time (JIT) production system may be the most important productivity-enhancing management innovation since Frederick Winslow Taylor's time-and-motion studies at the turn of the century. It is a Japanese innovation, and key features were perfected by Toyota. But there is nothing uniquely Japanese about JIT production. It is usable anywhere.

JIT production means producing and buying in very small quantities just in time for use. It is a simple, hand-to-mouth mode of industrial operations that directly cuts inventories and also reduces the need for storage space, racks, conveyors, forklifts, computer terminals for inventory control and material support personnel. More important, the absence of extra inventories creates an imperative to run an error-free operation because there is no cushion of excess parts to keep production going when problems crop up. Causes of errors are rooted out, never to occur again.

In some ways, JIT production is nothing new. High-volume continuous producers—for example, steel, chemical and paper companies—employ it routinely. To do otherwise would bury them in inventory. Long-term predictability of materials needed makes it possible for continuous processors to arrange for materials to flow into and through their plants steadily without inventory buildups. The Anheuser-Busch brewery in St. Louis unloads a nearly continuous stream of trucks bringing in empty cans and uses them soon enough that, on the average, there is only a two-hour supply of unfilled cans on hand.

But cans of Budweiser don't come in many different models. In most of the rest of industry, plants produce an ever-changing variety of goods, and production scheduling is complicated and irregular. JIT streamlines and simplifies the stop-and-go production of most plant operations so that they resemble continuous processing. In so doing, it forces planners and analysts to get out of their offices and get out on the floor solving real problems.

The transformation begins with inventory removal. Fewer materials are bought, and parts and products are made in smaller quantities; so-called lot-size inventories thereby shrink. Buffer stocks or safety stocks—"just-in-case" inventory—are also deliberately cut.

The immediate result is work stoppages. Plenty of them. Production comes to a standstill because feeder processes break down or produce too many defectives—and now there is no buffer stock to keep things going. This is exactly what is supposed to happen. For now the analysts and engineers pour out of their offices and mingle with foremen and workers trying to get production going again. Now the causes—bad raw materials, machine breakdown, poor training, tolerances that exceed process capabilities—get attention so that the problem may never recur.

When one round of problems is solved, inventories are cut again so that more problems crop up and get solved. Each round of problem exposure and solution increases productivity—and quality, too. In Japan extensive quality control measures blend nicely with just-in-time production because many of the problems uncovered by inventory removal are quality problems.

Some people who have studied the just-in-time system conclude that it is suitable for high-volume producers but not for smaller-volume "job shops." But many companies that call themselves job shops have some semblance of a product line; those companies can become more productive by producing in smaller lots as continuously as possible. If they don't, chances are that a Japanese competitor will emerge and capture enough market share to become a high-volume repetitive producer jeopardizing the position of the stop-and-go producers; this is what is happening to Harley-Davidson, International Harvester and Hyster.

How can Western manufacturers become JIT producers? One way is "cold turkey": Remove inventories from the shop floor, dismantle distance-spanning conveyors, move machines close together and permanently reallocate floor space that once held inventory. Spasms of work stoppages for lack of parts will soon get everyone involved in solving underlying problems.

Most companies will want to take a more incremental approach. One way is to cut the cost of machine setup, a major reason why companies make parts in large batches. Setup times can be cut by simplifying dies, machine controls, fixtures and so forth. The term "quick die change" has been in the vocabulary of American production engineers for years. But American management only heard of it recently as stories have trickled in from Japan about "single setup," which means a single-digit number of minutes, and "one-touch setup," which means zero setup (only load and unload) time.

The Kawasaki plant in Lincoln, Neb., uses another experimental approach. Occasionally it will deliberately draw down buffer stocks to near zero. The kinds of problems exposed will be recorded and assigned as improvement projects. Stocks will be allowed to build back up, and the improvement projects will proceed. As underlying problems are solved, stocks will then be permanently cut and storage floor space reallocated.

Geography is the big obstacle to just-in-time deliveries of purchased parts. When your supplier is across the country, the economies of full truck and rail car shipments often dictate infrequent large-lot buying. The Japanese companies that have opened subsidiary plants in North America—Sony, Honda, Nissan, Sanyo, Kawasaki, etc.—deal with this hurdle by resolutely seeking nearby suppliers.

Establishing those arrangements may take years of effort. In the meantime, consolidated loads from clusters of remote suppliers may permit a load to be delivered every day. Common carriers may be rejected in favor of contract shippers or company trucks, so that the day and maybe the hour of delivery may be strictly scheduled. And manufacturers must not tolerate the standard practice among U.S. suppliers of delivering plus or minus 10% of the agreed-upon purchase quantity. With no excess inventory, nor space to store it, the just-in-time company must insist on deliveries in exact quantities.

It is clear that geography is a deterrent, though not an intractable one. Aside from that, there are few obstacles. More money is not needed. The just-in-time approach features getting by with less of most of the costly resources that American manufacturers protectively surrounded themselves with in the days when capital was plentiful and interest rates were low.

The only significant obstacles to JIT are those that stand in the way of any major change in management system: reorienting people's thinking. Much of that task has been done. Just-in-time programs have been established at General Electric, the big-three auto makers, Goodyear, ROLM and various other American industrial companies.

Transforming our coughing, sputtering plants into streamlined just-in-time producers sounds like a 10- or 20-year project. It may not take that long because the innovating has been done for us. Taylor's innovation, scientific management, was readily exportable and implementable in Europe and Japan (and today the Japanese out-Taylor us all). The Japanese innovation, just-in-time, is equally transportable.

Mr. Schonberger, professor of management at the University of Nebraska, is author of "Japanese Manufacturing Techniques: Nine Hidden Lessons in Simplicity" (Free Press).

What Quality Circles Can and Cannot Do

By Kenichi Ohmae

Quality control circles, so spectacularly successful in Japan in recent years, hold little promise of short-term gains. They take generations to bear fruit, and cannot be expected to succeed if they are ordered by edict. Moreover, the scope of their achievement, though impressive over time, is limited.

A QC circle is a group of about 10 relatively autonomous workers from the same division of a company who volunteer to meet for an hour or so once or twice a month. After work (usually they are paid overtime), they discuss ways to improve the quality of their products, the production process in their part of the plant and the working environment. Their long-term objective is to build a sense of responsibility for improving quality, but the immediate goal is to exchange ideas in a place uninhibited by barriers of age, sex or company rank.

Japan's experience has revealed several preconditions for the success of QC circles. Some may be indigenous.

First, the work force must be intelligent and reasonably well-educated. Members of the circles must be able to use statistical and industrial engineering analysis. They must know what it takes to make things work on a nuts and bolts level, and they must be able to brainstorm together. It is no coincidence that the Japanese companies which have been most successful with these circles and other participatory methods for improving productivity (Hitachi, Teijin, Asahi Glass and Nippon Kokan) are also well-known for their fine recruiting and internal training programs.

Second, management must be willing to trust workers with cost data and important information, and to give them the authority to implement their ideas. At Japanese companies with successful QC programs, managers have tended to work their way up through the ranks: They really believe in their work force. It is no surprise to them that groups of workers, if given information and authority to experiment by trial and error, will be able to reduce downtime, waste or reworking—the sorts of questions that the circles are most effective in addressing.

Third, workers must be willing and eager to cooperate with each other. Unlike the suggestion box and other worker incentive programs which reward individuals, QC programs reward groups. A genuine "team spirit" is therefore necessary: Workers must be willing to express themselves and find fulfillment by reaching agreement.

Moreover, if authority in production decisions is to be decentralized down to the level of these circles, then the circles have to be able to cooperate with each other lest they work at cross-purposes. Unless there is a spirit of cooperation within the work force, an attitude that talking a problem through with peers is more rewarding than taking it up to management, a company is better off using individual carrots instead of the circles. Otherwise, it may find night shifts undoing the improvements of day shifts.

One of the most important features of QC circles in Japan is that they did not originate with senior management. They spring rather from a voluntary, grass-roots movement of workers and middle managers from across the nation.

The spearhead has been the Union of Japanese Scientists and Engineers, or Nikka-Giren. In 1962, it began publishing a magazine, later named FQC, which called for quality control circles among factory workers and foremen and helped precipitate a change from the Western concept of quality control as the prerogative of technical experts. The magazine circulated widely among industrial workers, who bought it themselves (it cost them about the same as a pack of cigarets) rather than receiving it through their employers, and read it together—in a circle. The magazine, together with a generation of supervisors familiar with QC concepts from the '50s, helped initiate massive training of non-supervisors.

The Nikka-Giren Union continues to have great influence. It publishes case histories of successful QC circles and sponsors regional and national conferences, where circle participants from different companies share their experiences.

Since most Japanese companies are very secretive with each other, this openness seems a paradox. But the movement was initially popular in the steel and shipbuilding industries, where there was a tradition of letting other companies freely inspect production methods and facilities. Had the movement started in the Japanese camera or auto industry, it is doubtful whether the current openness and cross-fertilization would have developed. Today, cross-fertilization is one of the keys to the success of the circles in Japan—the exchanges not only encourage but also keep workers interested in the process.

Quality control circles don't run themselves. They must be revitalized. Most important is the specific set of goals they are given and a strong manager who coordinates QCC changes with corporate objectives. In companies which use both the suggestion box and quality control circle, management can gather directly from workers ideas which may require significant capital expenditures and at the same time use suggestion box successes to encourage QCC efforts.

Management spends more time today on sustaining existing circles than starting new ones, understanding that their effects are incremental and cumulative. In 1951, Toyota received 700 proposals from its new worker participation program. Today it gets 500,000 per year, which save a reported $230 million.

But there are limits to what the circles can do. The abrupt quantum leaps in cost reduction that the Japanese have achieved in industries as diverse as steel and consumer electronics do not result from QC circles. Instead they come from major strategic decisions about new technologies and plants and entirely new ways of producing and delivering a product.

At Ricoh, for example, it wasn't a circle that figured out how to redesign the business system by changing the technology, manufacturing and marketing to completely change the game in plain paper copiers. Nor was it the circles that led to the elimination of inventory ("Kanban" system) at Toyota. QC circles, composed of workers from a single division, can't come up with these bold strokes.

Nor can they replace strategy. Indeed in many industries a single-minded focus on productivity improvements and concomitant quality control activities may be less important for success than focused R&D and targeted marketing.

Quality control circles work best when they are part of what the Japanese call total quality control, which embraces concerns about the entire spectrum of a business. And they are one of a number of productivity improvement techniques which work best when put together. As the Japanese would say, it's like collecting dust to make a mountain. But somebody has to envision the mountain, and know which way the wind is blowing.

Mr. Ohmae, a director of McKinsey & Co., runs the consulting firm's offices in Tokyo and Osaka. He is author of "The Mind of the Strategist" (McGraw-Hill).

Don't Expect Too Much From Your Computer System

By Richard L. Van Horn

In a world appropriately filled with glowing promises for computers, managers are well advised to reflect on what computers are not. For more than 20 years, businesses ranging from banking to bookmaking have embraced computer systems with a level of hope and enthusiasm normally reserved for risk-free, high-profit investments.

In the sobering light of actual use, some firms have realized many or all of their high expectations, but others have discovered that computer systems are hardly risk-free and certainly are no guarantee of higher profits. A computer system represents an expensive, high-technology capital investment, and such investments often promise high returns only for high risk. At a minimum, such investments demand thoughtful and continuing attention from management.

A computer system, no matter how successfully applied to a problem, does not guarantee improvement. For example, a computerized inventory system with poor ordering rules will reorder the wrong quantities of the wrong parts faster and more consistently than its manual counterpart. The computer's outstanding attributes of speed, large memory, consistency and the ability to follow complex logical instructions are of value only to the extent that they are applied within a good management process. Computers are a complement to, not a substitute for, careful management.

Computer users must remember that precision is not accuracy. Without question, computers operate with great precision. They can perform long and complex processing of instruction, text and numbers without introducing any new errors. As a result, computer output neatly printed on display screen or paper is often treated like pages from Holy Writ. This computational fundamentalism is, as many managers have found through costly experience, a dangerous assumption.

Computer output can be better than the data put in, in the sense that computers can find and correct certain types of errors. But many errors in input data are impossible to detect, particularly those made at an earlier stage in collecting the information by other people or recording devices. From salesmen to machinists, people tend to "adjust" input to fit their view of the world.

All large programs contain errors, at least in the sense that they do not always work as either their authors or users intended. Because of the complexity of large business programs, that may contain thousands of instructions, errors remain even after years of use. A healthy skepticism about the accuracy of the output is the best antidote to being stung by a hidden program bug.

Some business problems are just too complex or ill-defined for computers to solve. Scheduling machines in a job-shop, for example, is a problem that is "solved" every day by people, but may need months of computing time for an exact, numeric solution—if any is possible. And each set of new or changed orders would require further month-long computer runs to take these everyday alterations into account.

In making the decision whether to market a new laundry detergent (or magazine, car or frozen food), computers can keep track of survey results, calculate costs, analyze a range of assumptions and handle other pieces of quantitative bookkeeping. But in the end, those making the decision must fall back on that strange mixture of experience and gut feeling we call human judgment. As with factory scheduling or investments in the stock market, computers can help, but they certainly can't guarantee success.

A company overwhelmed by paper work or plagued by decision-making channels too complex for its employees to navigate certainly should consider computer support. If a software vendor has a program or set of programs that can be used essentially off-the-shelf, that computer application could be operating satisfactorily in a few weeks or months. But tailoring a new package to a reasonably complex application of any kind—order processing, inventory, accounting or market analysis—will take several years of analysis, design and testing.

In many problem areas, management should not—indeed, cannot—wait for a computer system solution. Urgent problems should be attacked with better procedures, tighter controls, more manpower and the whole range of traditional management tools. Aside from preventing a possible operating disaster, the short-term correction of problems often provides valuable insight to designers of longer-term, computerized solutions.

Regrettably, even applying computers carefully and correctly in every respect may yield little if any benefit. There is a widespread belief that "doing things right" is the key to good management. In truth, many of the activities that go on in a firm have no noticeable effect on cash flow or profit. Better—more timely, more accurate, more complete—accounting information may neither sell more products nor reduce costs. Peter Drucker summarized the issue aptly with his view that the critical management function is not to do things right but to do the right things.

The Japanese auto companies provide some interesting illustrations. It was the U.S. companies that developed and applied outstanding decision rules and computer systems for managing inventories of expensive components such as starters and alternators. The Japanese simply built the parts plants next door to the auto assembly plant, and got rid of inventories altogether!

In the final analysis, we must both apply computers correctly and apply them to the right problems if we want to have a significant impact on the welfare of the firm.

Mr. Van Horn, formerly head of management systems for Rand Corp., is chancellor of the University of Houston.

Keeping Favoritism and Prejudice Out of Employee Evaluations

By Andrew S. Grove

In my book, "High Output Management," I characterized performance reviews as the single most important form of task-relevant feedback with which we supervisors can provide our employees.

What I said has not been enthusiastically received in all quarters. A teacher friend of mine heatedly insisted that performance reviews—and compensation and promotional practices based on those reviews—would not elicit better work but only favoritism in her school system. Another objection was raised by a lawyer I know who haughtily announced that nobody, simply nobody, could judge the quality of his work. Comments of this type have reached me from other quarters as well.

In spite of the criticisms, I remain steadfast in my conviction that if we want performance in the workplace, somebody has to have the courage and confidence to determine whether we are getting it or not. We must also find ways to enhance what we are getting.

But let's examine these criticisms carefully, taking the lawyer's position first. I am quite sure that in any sizable law firm, an experienced and senior partner can make a meaningful evaluation of my friend's work, no matter how arcane the work might seem. After all, professionals go through intensive series of evaluations during their education. And during their internship, and subsequent professional practice, professionals acquire and share basic facts and values that provide a good basis for meaningful dialogue and mutual evaluation.

This is not to say that when professionals are faced with a complex problem, there is only one way to handle it. Assessing performance is not an *act* but a *process;* even if the opening barrage is off the mark, the resulting exchange is likely to tune and perfect the work performed. In fact, the more obscure and intangible the nature of the work in question, the more such an exchange is likely to contribute to its quality.

For example, some years ago when I was supervising a number of semiconductor engineers, one of them discovered a technique that turned out to be extremely useful in solving an important problem. This solution brought recognition, praise and a lot of satisfaction to my subordinate.

However, as time went on, he fell into the pattern of attempting to solve all problems with this same technique, even though it had no relevance to them. This led to wasted effort and a lot of frustration. When I pointed out this pattern to my subordinate, he got defensive at first. He thought I was trying to minimize the importance of his earlier achievement. As we talked about my observation some more, I eventually succeeded in convincing him that his insistence on using the same technique over and over was counterproductive. Eventually, he managed to break his thinking pattern and address his new problems with a fresh approach each time, thus regaining his earlier effectiveness.

The very idea of non-reviewability of professional work means that only the most monstrous errors get evaluated—after the worst has been perpetrated, and then frequently during the course of malpractice litigation. I think we can reduce the waste and damage caused by this practice in our society by agreeing on a basic principle; namely that *all* work can and must be subjected to review by somebody.

As for the teacher's fear of favoritism, obviously power—

and the right to evaluate *is* power—can corrupt. What we as managers have to do is build enough checks and balances into the system to minimize the influence of personal bias and distortion. At Intel, we use three safeguards.

Once an employee review is written up by a supervisor, the supervisor's boss oversees and approves the written evaluation. This manager is the second most qualified judge of the employee's performance—second, that is, to the employee's immediate supervisor. Being one level removed, he can put the employee's performance in broader perspective; he is in a position to compare it with the work of other people in a larger organization.

Our second check of the evaluation process stipulates that the personnel representative assigned to the employee's department approve the review. Although someone from personnel probably can't judge the quality of highly technical endeavors, he is likely to catch signs of favoritism and prejudice, and call it to the attention of the immediate supervisor's manager. For this to have real effect, we must endow the personnel department with enough status and clout to make its opinions and comments count.

The third check comes from setting up ranking sessions, where the supervisor meets with his peers and, together as a group, they compare and rank all of their subordinates. Of course, no one supervisor can assess the work of all subordinates of his peers. But collectively, enough will be known about each employee to provide additional—and frequently conflicting—points of view to the assessment process, resulting in a fair outcome for everybody.

Do such checks and balances weed out all bad evaluations? They do not. No system is foolproof, especially one that is necessarily laden with human judgment. Furthermore, such an evaluation process takes much more time and effort than simply listing a group of employees by date of hire and letting it go at that (the basis of a seniority approach to evaluating performance). At Intel, we estimate that a supervisor probably spends five to eight hours on each employee's review, about one-quarter to one-third of 1% of the supervisor's work year. If the effort expended contributes to an employee's performance even to a small extent over the course of a year, isn't that a highly worthwhile expenditure of a supervisor's time?

We are paid to manage our organizations. To manage means to elicit better performance from members of our organization. We managers need to stop rationalizing, and to stiffen our resolve and do what we are paid to do.

Mr. Grove is president of Intel Corp. in Santa Clara, Calif., and is the author of "High Output Management" (Random House, 1983).