

The Wisdom of Chairman Ko

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Striding into work wearing an utterly nondescript gray business suit, Ko Nishimura may be the walking embodiment of Shibui, a Japanese concept that refers to a state of uncluttered, beautifully efficient austerity -- the perfect balance between not enough and too much. Although his net worth, which recently totalled more than \$50 million, continues to grow as does the stock price of his electronics-manufacturing company, the spry, 61-year-old CEO of Solectron Corp., the world's largest and fastest-growing contract manufacturer, still leaves for work each morning from the same modest San Jose, California tract home that he and his wife have lived in since 1964.

At 6:00 AM sharp, the former IBM engineer turns his decade-old, but perfectly maintained Honda Accord into one of Solectron's overflowing parking lots. He then searches out a space near its faceless world headquarters, in Milpitas, California, and walks to his 12-by-12-foot cubicle, which, despite its modest size, is still the largest office in the building.

"I'll bet it took you 15 minutes to figure out which tie would go with the suit you're wearing," he says, plopping down in a drab conference room just across from his cube. "I can dress in two minutes!" He proudly explains that his socks are all the same color -- as are most of the dress shirts that his wife irons for him and the suits and ties that she hangs in his closet. "I can grab any suit, any pair of socks," he says. "It's foolproof!"

Since taking the company's helm eight years ago, Nishimura has grown Solectron into a megacontractor with \$6 billion in annual revenues. His method for success is a strategy for high-tech manufacturing that owes much to the sparing efficiency that defines his wardrobe. His off-the-rack suits and plain-white shirts won't land him on the cover of GQ magazine, but their top-quality materials and efficient tailoring ensure that nothing is wasted in making him as presentable as he needs to be -- and not a single pinstripe more. "Being the best in manufacturing means eliminating waste and knocking out unnecessary costs," he says simply. "You have to find that gray zone between too much and not enough. If you go too far, you're gaudy and wasteful. If you don't go far enough, you're shoddy and inelegant."

Just how Nishimura and his Solectron colleagues maneuver into that elusive sweet spot provides a lesson in the powerful marriage of old-school, Ben Franklin-esque management values and today's e-everything economy. The most radical technologies and revolutionary business models are indeed changing the way companies like Solectron function. They are necessary -- but not sufficient -- to ensure profitability year after year. That's especially true when it comes to the nuts and bolts of contract manufacturing, a burgeoning, albeit decidedly unglamorous, industry.

The way this zone of the economy works is simple and relentless: High-volume original-equipment manufacturers (OEMs) outsource their actual manufacturing to contract manufacturers like Solectron. The OEMs get lightning-fast turnaround on their orders and quality high enough to give them the confidence to put their own brand on each product that is built for them. The contract manufacturer, in return, earns a razor-thin profit.

In many respects, this is trench-warfare competition in the high-flying new economy. But the requirements for winning -- and there's no question that Solectron does win, not only contracts and profits but also more than 200 quality and service awards and the 1991 and 1997 Malcolm Baldrige National Quality Awards -- bear out Ko Nishimura's teachings about the essentials of good management, good strategy, and good customer service.

Solectron's rise to glory comes a scant decade after business observers were lamenting the death of manufacturing in the United States and of American competitiveness in the proud, yet dirty-fingernailed, world of production. Nishimura's Solectron has responded to those

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obituaries. One key lesson from Solectron: Globalization may be changing the face of manufacturing, but the actual source of a manufacturing company's success is decidedly local.

Winning today takes more than strategically placing state-of-the-art factories around the globe. It takes workers who have both the incentive and the authority to effect the necessary changes that will create the next small but important efficiency in the manufacturing process and to accommodate the next small but inevitable change their OEM customers demand. It takes speed in responding to ever-shrinking product life cycles, and it also takes focus to meet uncompromising, just-in-time delivery schedules.

To do all that, Solectron has fashioned a fast, customer-centric system of communication and reward that melds traditional management values culled from IBM -- the former employer of many Solectron top executives -- with technology-savvy manufacturing and supply-chain-management practices. The impressive result is a company that has fast become better at building electronics than some of the world's most renowned high-tech manufacturers -- an increasing number of which have, in fact, turned over their production lines to Solectron.

Since Nishimura joined the company, about 11 years ago, a buying binge of 16 plants has brought Solectron's total number of factories to 23 throughout the world. With its growth, Solectron has assumed responsibility for manufacturing a remarkable array of high-tech products for some of the world's best-known, most-respected companies: producing motherboards for IBM laptops, electronic cash registers as well as all retail and computer products for NCR Corp., and cell-phones for Mitsubishi Corp. -- marking perhaps the first time that a Japanese electronics manufacturer has hired an American company to assemble its products.

Solectron's continuously improving processes have created a win-win strategy that lets both Solectron and its customer-partners concentrate on what each does best. And Solectron has implemented a set of efficient, innovative business practices that are capable of returning America's electronics companies to the forefront of the world's manufacturing sector.

"The supply chain had to be shortened. It was the only way to revive the competitiveness of the American electronics industry."

Not long ago, U.S. electronics manufacturers were struggling to keep pace with their overseas rivals. With computer prices spiraling downward amid improving technology and increasing competition, the only way to make money was to get new products to market as cheaply and as quickly as possible. Unfortunately, the strategy of choice seemed to pit cost against speed. U.S. companies could export the assembling of PCs or ink-jet printers to third-world workers who earned \$2 a day, thereby lowering costs. But the move overseas did little to speed up the delivery process of finished goods to customers. And with product life cycles shrinking by the day, even a few weeks on a slow boat from Asia could mean the difference between a successful launch and an outright failure of cutting-edge products.

"The supply chain had to be shortened," Nishimura says of the situation he encountered in 1988, when he left IBM after 23 years to become Solectron's coo. "It was the only way to revive competitiveness in the U.S. electronics industry."

Solectron was in the perfect position to do that. Although it had started out as a California-based manufacturer of solar-energy products during the energy crisis of the 1970s, the struggling startup soon began contracting itself out to Silicon Valley's burgeoning electronics industry. "We hopped on the outsourcing bandwagon," says Winston Chen, 58, a former IBM engineer who was part of the team that bought Solectron in 1978 and who later convinced Nishimura -- Chen's former boss -- to help run the fast-growing company. "We were right in our customers' backyards, so we could respond faster and turn around orders more quickly."

Taking a lesson from IBM's first president, Thomas Watson Sr., Chen ran the company using two guidelines: "superior customer service" and "respect for individual workers." Both those precepts could be carried out, he figured, by establishing a system of fast feedback that gave

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Solectron workers the information they needed to respond quickly to customer needs and market conditions, coupled with the freedom to act in the best way they knew how.

Proclaiming a "customer first" guideline, Chen established a system for assessing customer satisfaction not on a yearly or quarterly basis, but every week. Solectron's customers rank the company on five criteria: quality, responsiveness, communication, service, and technical support. The survey results are posted weekly at the front of every Solectron production line. "We don't tell people, 'You're good,' or 'You're bad,' " says Chen. "We say, 'Here's what customers say.' That's a very powerful tool."

The second piece of the feedback loop is a weekly profit-and-loss statement for each production line that's distributed to all line managers. "We just told them, 'You can't lose money,' " Chen says. "This is your scorecard. You have to decide what to do.' "

That was another lesson taken from his IBM experience. "At IBM, the majority of people didn't know the profit for their division for months," says Chen. "They worked hard, but they just didn't get feedback. If you really want to respect individuals, you've got to let them know how they're doing -- and let them know soon enough so they can do something about it. Ultimately, the measures that matter are customer satisfaction and profit and loss."

Chen's fast-feedback system worked. By the time he convinced Nishimura to join Solectron in 1988, revenues had already increased 200-fold to about \$93 million, and profits had more than doubled.

"Never be satisfied. Never be bound by conventional wisdom."

With Solectron's star comfortably hitched to the accelerating outsourcing train, Nishimura had little reason to push for big changes when he sat down at his first management meeting. Yet the second-generation Japanese-American Zen Buddhist, who says his greatest influence was his immigrant grandmother, arrived with a cultural (if not a genetic) predisposition for continuous improvement -- and for continuously questioning existing practices. For example, although an engineer by training, Nishimura questioned standard financial practices. After listening to CFO Susan Wang, 48, detail her success at shortening the company's financial-feedback loop, Nishimura produced his own management standards. "We'd just decreased the financial-closing cycle from three months to three days, which I felt was a major accomplishment," recalls Wang, another IBM refugee who arrived at Solectron in 1984. Unimpressed with Wang's achievement, Nishimura asked her, "Do you think that's good enough? Why wouldn't you close the books every day?"

" 'Excuse me?' " Wang remembers saying. "Three days was a benchmark practice. At that time, few companies could claim that record. But then I realized that he was just saying, 'Never be satisfied. Never be bound by conventional wisdom.' "

That attitude had earned Nishimura a reputation as something of a maverick at IBM. For instance, he once skirted procedure to rush a new disk-drive design to market. Instead of going through normal bureaucratic channels to set up a development lab, Nishimura searched out a suitable space on his own, then rallied his team to set up the lab over a weekend. "It would have taken months if he had followed the standard procedure, but he bypassed the whole system," recalls Phil Fok, 38, an IBM veteran who is now Solectron's director of operations. "He's always been one to question the rules."

Applying the same ethic to Solectron's manufacturing operations, Nishimura challenged established standards as he searched for ways to improve Chen's customer-first model. He soon came across an ad in an electronics magazine soliciting applicants for the Malcolm Baldrige National Quality Award. Congress established the Baldrige in 1987 to help revive the nation's then-weakening manufacturing sector. Nishimura sensed that the Baldrige was more than just an award for product quality; its seven-point evaluation process closely matched Solectron's principles and could serve as a benchmark for continuous improvement. "I brought the ad to a staff meeting," says Nishimura, "but they said, 'Great, another

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management flavor of the month.' " Unfazed by the reaction, he persuaded the group to apply for the 1989 award. "We turned our application in after working on it for six weeks," says Nishimura. Solectron's entry failed to impress the award committee. "We didn't even get a site visit."

But Solectron did receive a report from the Baldrige evaluators that outlined what they saw as improvements the company needed to make in its human-resources, strategic-planning, and supplier-management functions. "They said that we needed to focus even more on the customer, and that we didn't do enough long-range planning with the customer in mind," says Nishimura. To a more egotistical CEO, the Baldrige response would have seemed like a rebuke, a slap in the face. But Nishimura considered it a gift. "They gave us free consulting!" he says. "It was great!"

Nishimura set about incorporating the Baldrige prescriptions, initiating a "customer executive survey" on Solectron customers' long-term technology and production needs. He used that feedback to establish a long-range-planning process -- hoshin kanri, a Japanese system of internal communication that has been credited for the success of several Japanese winners of the Deming Prize, a quality prize after which the Baldrige was patterned. Adopting the hoshin system, Solectron established one- and three-year strategic plans for individual plant managers to incorporate into their processes.

The next year, Solectron was back in the Baldrige competition, submitting an entry that documented the company's initiatives. And the next year, the Baldrige award committee's report advised more improvements in benchmarking and supplier management. So Nishimura followed the prescription again. "We weren't trying to win the award," Nishimura says of Solectron's second Baldrige application. "We were simply trying to build a quality company. And the award was the template."

Solectron's third application, in 1991, finally yielded a site visit from the examiners, which Nishimura figured was worth about \$250,000 in consulting fees. But the payoff proved even greater: The committee awarded the prize to Solectron in a White House ceremony in October. It was the first and only time a company in the often-maligned outsourcing industry had garnered the quality prize. The first time, that is, until 1997, when Solectron won a second Baldrige, making it the only two-time winner in the award's history.

Baldrige Award recipients are ineligible for the quality prize for five years. So Solectron has developed an internal assessment process fashioned after the Baldrige. "We want to be the best at what we do," says Nishimura. "Our internal process, which we administer every 18 months, keeps us focused on continuously improving things for our customers. That's the only way to be the best."

"I need these people. I need these people -- and more"

In a sector once disdained as being an unsophisticated collection of low-paying assemblers, Solectron's Baldrige achievements have helped repair the industry's bad reputation and demonstrate that contract manufacturers can be trusted to handle even the most demanding tasks. "We used to be thought of as a sweatshop industry," says Nishimura. "Now we're rated investment grade by the likes of Standard & Poor's and Moody's."

Other OEMs couldn't be more pleased. Anxious to cut costs as well as to rid themselves of the tedious, unsexy job of actually building the products that they design and sell, company after company has sold off its factories and turned over production to contractors like Solectron. The strategic shift on the part of the OEMs has given Nishimura the enviable opportunity to pick and choose his customers. In the process, Nishimura has globalized Solectron's holdings with a series of major acquisitions that have expanded its technology and manufacturing base along with its employee roster, which has tripled since 1995 to approximately 33,000 "associates," the name that Solectron uses for all of its workers.

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Any acquisition can be a major undertaking: It can stretch the resources of the acquiring company, and test the attitude and commitment of the acquisition. But Solectron's purchases seem to have worked for both sides. People who now work for Solectron have found new energy after working for OEMs that had little genuine resolve to succeed. And for his part, Nishimura has stayed true to Solectron's core principle of respect for individual workers, and found value not only in the high-tech factories that he acquires but also in the everyday workers whose commitment he requires.

"I need these people," he exclaimed last year, while touring NCR's retail-systems factory, in Duluth, Georgia, near Atlanta. "I need these people -- and more."

Nishimura's message was just what veteran NCR manufacturing director Jim Wallace had hoped to hear. Wallace, a 38-year-old North Carolina native, had helped design NCR's suburban Atlanta factory in 1989, and he'd since poured years of sweat into creating margin-building efficiency in the sprawling, 300,000-square-foot plant and its 700 employees.

That wasn't an easy task: NCR's fortunes roller-coastered, buffeted first by being acquired by AT&T in 1995, and then by being spun off. Management struggled to redefine its strategic focus, and priorities soon shifted from hardware manufacturing to software and services. A push to reduce employee head count followed, and support for and investment in manufacturing all but dried up. "It's not our core competency," Lars Nyberg, 47, NCR's CEO, says of his decision last year to sell off the company's entire manufacturing division. "The hardware just isn't crucial to us."

To Wallace, a manufacturing man working for a 113-year-old company that once defined itself as the world's leading builder of nuts-and-bolts cash registers, Nyberg's sentiment repudiated everything he'd worked to achieve. Then, late in the summer of 1997, his boss explained that the company had made some "strategic changes." The big news: Management had concluded that the best way to move forward would be to outsource NCR's manufacturing operations. "At first, I felt as if I had been kicked in the stomach," says Wallace, who started working for the company after he graduated from Georgia Tech in 1987. "I felt as if there was no appreciation for what had been accomplished."

To add insult to injury, Wallace was asked to help engineer his own downsizing. He would have to find a buyer for the entire Atlanta operation and then hammer out a favorable outsourcing deal. Wallace had already overseen the plant's contracting out of printed circuit boards and other piecemeal assemblies. But when he had looked at outsourcing additional operations, he found that "it wasn't economically justified. My first feeling was that the company would be worse off by additional outsourcing. I was pretty cynical about the future of the entire operation."

But his gloom began to lift when Nishimura visited the plant a few weeks later. Solectron's CEO was among the first to express interest in buying the NCR factory, and his enthusiasm for the operation was infectious. "This can work!" Nishimura said -- in stark contrast to another potential buyer who had ominously estimated a significant layoff. Seeing a growth opportunity where others saw only a cost-cutting headache, Nishimura would use the plant's excess capacity to serve other outsourcing customers, squeezing additional efficiency from the plant and saving hundreds of jobs in the process. "It was a totally different perspective," says Wallace. "Rather than seeing us as a necessary evil -- a cost center to be controlled -- he saw us as a business in which manufacturing was the core competence."

Wallace was already impressed with Solectron, which had been a trustworthy supplier of printed circuit boards to NCR for four years. More than just a hollow promise, Solectron had backed its customer-first policy with weekly customer-satisfaction surveys, the feedback from which -- to Wallace's amazement -- was addressed within days.

Despite lingering doubts about the decision, Wallace told his NCR bosses that he would support the effort. But on one condition: If the choice wasn't Solectron, he wouldn't be involved.

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NCR's chief executive happily obliged. Solectron's offer, which promised to retain all the Duluth plant's workers, "was a very smart move," says Nyberg. "We lowered our costs without sacrificing quality, and they got to profit by increasing the factory's efficiency"

"Re-create the business -- from scratch."

The key to the success of Solectron's NCR purchase, and to its other acquisitions, is that Solectron gives its plant managers the authority to run their operations as if the plants are the managers' own businesses. Solectron also keeps corporate bureaucracy to a minimum, and it shares profit-and-loss information with the rank and file. After basic financial goals are set, managers can bring in new business, invest in plant equipment, and manage their staffs as they see fit. Meanwhile, quarterly "variable pay" programs for both managers and line workers tie bonuses directly to plant performance, and Solectron's stock-purchase program has put a total of more than \$1 billion worth of stock into the hands of its workers, even its part-time employees.

While Wallace and his fellow managers scrambled to calm the widespread rumors and concerns about the pending deal, it would be the managers themselves whose roles would change the most. "We had to re-create the business -- from scratch," says Bob Hawkins, the newly minted vice president of Solectron Georgia.

When Hawkins had been the factory's head of operations for NCR, he had neither responsibility for, nor knowledge of, his factory's impact on NCR's bottom line. "It was simply a cost center," says Hawkins, who notes that NCR handled sales, finance, accounting, and human-resource functions. "We didn't even pay our own bills."

So Hawkins and Wallace began honing their accounting skills and took a hands-on crash course in running a business. Of course, they got plenty of support from Solectron, which by then had more than a dozen acquisitions under its belt and already had a 90-item checklist for helping factory managers transform their operations into profitable businesses. But Solectron still gave Hawkins and Wallace the freedom to search out and integrate whatever management policies they deemed best for achieving Solectron's core goals of superior customer service and individual respect -- and, of course, profitability.

"We did some benchmarking, but a lot of it was common sense," says Wallace, pulling out a chart showing the average sick time claimed by the operation's workers. Under NCR's companywide policies, full pay for sick time was guaranteed for all employees who worked at least 26 weeks per year. The policy's unintended effect, however, was to provide unlimited sick pay for scofflaws who knew how to work the system. "It was very frustrating," says Wallace, pointing to a bar graph showing nine hours of sick time claimed each month by the average NCR line worker. "But under the old system, there was nothing we could do about it."

So Wallace and the plant's human-resources director Beth Introini sketched out a new plan under which sick pay would accrue at a rate of five days per year. Within a few weeks of the change, sick time dropped to an average of less than two hours per month. "The most amazing part was that we made the change without dealing with miles of red tape," says Introini, who was a 13-year veteran of NCR's corporate bureaucracy. "Although we were joining this huge company with 25,000 people, I felt as if we were a startup."

The team's wholesale review of the unit's management policies led to even more changes. An NCR policy that kept employees from claiming sick pay on days adjacent to holidays was scrapped. Reimbursements for educational expenses, formerly okayed for everything from language classes to ballet lessons, were granted only for courses that benefited the business. To put on the best face for a new array of Solectron customers visiting the plant, dress codes were tightened and cleanliness policies enforced.

Not everyone was happy with the new system. Wallace estimates that about 4% of the site's workforce quit in the wake of the changes, while another 2% failed to meet the new requirements and were fired. But he says that the vast majority of workers approved of the

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shift. "It boosted morale because the small number of people who abused the system couldn't do it anymore," says Wallace. "It weeded out the people who weren't willing to pull their own weight."

Meanwhile, those who remained knew exactly where they stood, and what they needed to do to succeed. Solectron's "variable pay" bonus program provided the cornerstone of the new system. NCR's annual bonus program had doled out cash totaling a percentage of workers' yearly pay -- but with an odd effect. "When it was awarded, no one knew what they had done to deserve it," says Bob Hawkins.

Solectron's bonus program, on the other hand, ties quarterly payments for both managers and line workers directly to dollars-and-cents objectives. Digital signs displayed on the walls alternately flash the day's production goals and quality yields for each production line. Results from weekly customer surveys (which influence 20% of the quarterly payment) include scores on five performance criteria and are prominently posted for each production worker to see. Meanwhile, "quality committees" dispatch teams of peer reviewers throughout the production facility to measure additional standards such as cleanliness and organization.

The rigorous, almost constant system of review is not without its critics. "Sometimes it's annoying," says Shameen Jackson, an eight-year veteran of the paperwork-processing group at the Duluth factory. Along with many workers, Jackson grumbled at first about new random cleanliness audits, rigid attendance policies, and rules mandating that all workers wear white smocks emblazoned with the Solectron logo. "At NCR, there was always an emphasis on quality," Jackson says. "But it's more strict here. NCR is our customer now, and we have to prove ourselves every day."

The transition from colleague to customer has put more pressure on managers like Wallace. "In the past, we used to say to members of NCR's product-development group, 'You can't do that,' or 'You can't have this production schedule,'" recalls Wallace. "But now they, as the customer, drive the decision making. We have to work much more closely with them in the planning process, because their input drives our forecasts and business results. And if our business results decline, our variable pay will decline."

Despite the added pressure and scrutiny, Wallace and Jackson ultimately say that they like the new way of measuring things. "We're graded on what we can control," Jackson says. "And we see the result in those quarterly checks."

"Get the job done for the customer, despite the rules."

For all the entrepreneurial spirit that Solectron's line-of-sight reward system engenders, such motivation could never have made the company into an industry juggernaut without considerable coordination and standardization of common processes -- a well-designed collection of companywide practices that ensure that ink-jet printers manufactured in Malaysia are exactly like the ones built in San Jose. That's especially critical in a thin-margin business like outsourcing, where volume is the key to growing profits and the only way to leverage buying power and efficiencies of scale.

More important, it's what customers demand. "As a customer, my biggest complaint about Solectron was that I felt as if I was buying from 10 different companies," says John Caltabiano, a former NCR materials buyer who contracted Solectron to supply printed circuit boards and other components before becoming the Duluth plant's materials director. "When I go to a supplier, I want the quote to look the same. I want the people to look the same. I want consistency, no matter which location I'm dealing with."

That puts Nishimura in the awkward position of trying to balance the need to standardize across the company with the need for individual empowerment that has helped make Solectron so successful. His aggressive "common processes" campaign to systematize everything from the ubiquitous white Solectron smocks to the combined purchase of approximately \$6 billion in materials and equipment each year has helped the company

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present a single face to its customers and has leveraged Solectron's growing clout as one of the world's biggest buyers of printed circuit boards and semiconductors. "That clout not only helps us get the best price," says Caltabiano, "but it also helps when important components are in short supply. We're always the first in line. It makes us both more price competitive and a more reliable supplier in our customers' eyes."

But striking that balance is not so easy: Systematizing everything has squelched some decision making that had once been left up to individual managers and sacrificed some workers' sense of individuality. "The smocks make you feel like a robot," says one worker on the cell-phone production line at Solectron's Brazelton, Georgia plant, which was purchased from Mitsubishi Electric last year. The worker was told that the smocks prevent static electricity from damaging sensitive circuit boards, although she already wears a special static-neutralizing wristband attached to a cord that binds her to the production line. "We didn't have to wear smocks when we worked for Mitsubishi, and we had great quality," says the worker. "Why should we have to wear them now?"

Meanwhile, the Mitsubishi plant's right-to-left surface-mount production setup was the opposite of Solectron's common-processes guideline. "Moving to the corporate standard always involves some pain," says Larry Sauls, the general manager. "Standardization of the equipment doesn't match our customers' unique requirements, and our changes have to support their needs, rather than support the company's standards."

That point was driven home last year after another Solectron plant failed to purchase equipment according to the new company standard. "The managers were trying to start up a production line very quickly, and, if they followed the rules, it would have taken about three months to get it up and running," recalls Phil Fok, the operations director. "These guys ordered equipment from an unapproved vendor, and didn't follow any of our common-process procedures."

The managers got the production line up and running in three weeks -- and also provoked Nishimura's anger. "He was going to penalize the guys for not following the rules," recalls Fok. "He said, 'We'll never get the leverage we need if we continue to act as independent entities.' I had to remind him, 'You hired people who do what you pride yourself on, which is the ability to get the job done for the customer, despite the rules.' "

And when the subsequent customer-satisfaction survey glowed with praise for the managers' efforts, Nishimura swallowed his harsh words. "This was the exception that makes the rule," says Nishimura, perhaps remembering his own break-the-rules days at IBM. "We're pushing hard for common processes and common practices, but the rules of the game are still 'customer first.' "