

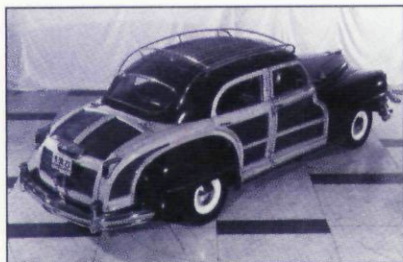


Chrysler transplanted Japanese-style supplier relations to the competitive soil of the United States.

How Chrysler Created an American Keiretsu

by Jeffrey H. Dyer

Borrowing from Japanese practices, U.S. manufacturers have cut their production and component costs dramatically in the last decade by overhauling their supplier bases. They have radically pruned the



ranks of their suppliers and given more work to the survivors in return for lower prices. And by getting their remaining suppliers to deliver parts just in time and to take responsibility for quality, they have managed to slash inventories, reduce defects, and greatly improve the efficiency of their own production lines.

Now many manufacturers are striving to wring even greater benefits from their suppliers. They would like to involve suppliers much more deeply in product development and to enlist them in the drive for continual improvements of production processes. The prizes they are seeking: ever more innovative products, ever faster product development, and ever lower costs.

But as many managers now realize, accomplishing the first stage

was relatively easy because it did not require altering the nature of their relationship with suppliers. The traditional adversarial relationship remained: Manufacturers continued to design products largely without



input from suppliers, to pick suppliers on the basis of price through a competitive bidding process, and to dictate the detailed terms of the contract. They continued to expect suppliers to do as they were told and not much more.

In sharp contrast, the second stage—involving suppliers in product development and process improvement—requires radically changing the nature of the relationship. It requires a bona fide partnership, in which there is an unimpeded two-way flow of ideas. Although many managers now talk about their desire to turn their suppliers into partners, the fact of the matter is that actually doing it—after decades of exploiting suppliers by pitting one against the other—is exceedingly difficult. Indeed, the task is so diffi-

cult that some executives wonder whether the Japanese partnership model can or even should be transplanted to the United States, where competitive, contractual, arm's-length relationships between manufacturers and their suppliers have long been the norm. They rightly point out that the partnerships among the members of a Japanese keiretsu grew out of cultural and historical experiences that are very different from those that shaped U.S. industries and companies.

One U.S. manufacturer, however, has shown that it is possible to make the transition. This company is Chrysler Corporation. Its experience demonstrates not only that a modified form of the keiretsu model can work in the United States but also that the benefits can be enormous.

Since 1989, Chrysler has shrunk its production supplier base from 2,500 companies to 1,140 and has fundamentally changed the way it works with those that remain. Instead of forcing suppliers to win



its business anew every two years, Chrysler now gives most of them business for the life of a model and beyond; excruciatingly detailed contracts have given way to oral agreements. Instead of relying solely on its own engineers to create the concept for a new car and then to design all the car's components, Chrysler now involves suppliers deeply. And instead of Chrysler dictating prices to suppliers, regardless of whether the prices are realistic or fair, the two sides now strive *together* to find ways to lower the costs of making cars and to share the savings.

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The results have been astounding. The time Chrysler needs to develop a new vehicle is approaching 160 weeks, down from an average of 234 weeks during the 1980s. The cost of developing a new vehicle has plunged an estimated 20% to 40% during the last decade to less than \$1 billion for the Cirrus/Stratus, introduced this year. And, at the same time, Chrysler has managed to produce one consumer hit after another—including the Neon, the Dodge Ram truck, the Cirrus/Stratus, and the new minivan (sold as the Town & Country, Dodge Caravan, and Plymouth Voyager). As a result, Chrysler's profit per vehicle has jumped from an average of \$250 in the 1980s to a record (for all U.S. automakers) of \$2,110 in 1994. (See the insert "How Supplier Partnerships Helped Revive Chrysler.")

Of course, Chrysler's astounding comeback is hardly news anymore. But surprisingly, one crucial aspect of the story has been overlooked: exactly how the company managed to



transform its contentious relationships with its suppliers. Believing that Chrysler's turnaround might hold lessons for other U.S. manufacturers, I undertook a three-year study of the company's revival. From 1993 to 1996, I interviewed 13 executives at Chrysler and also 33 of the company's suppliers, and analyzed thousands of pages of Chrysler's documents.

From this work emerged a blueprint of the steps that other companies might take to build their own American keiretsus, providing that those steps are accompanied by the exemplary management—or, more accurately, the exemplary leadership—that Chrysler's executives displayed. Four men in particular—Robert Lutz, Chrysler's president; François Castaing, the head of

vehicle engineering; Glenn Gardner, LH program manager; and Thomas Stallkamp, head of purchasing, planted the seeds and then nurtured Chrysler's keiretsu. By benchmarking competitors, listening to suppliers, and experimenting with ideas and programs, they gradually developed a vision of the changes that Chrysler needed to make. They came to realize that those changes required transforming both the process of choosing and working with suppliers and the personal relationships between Chrysler's staff and its suppliers. They came to understand that people—both at Chrysler and in suppliers' organizations—must have a common vision of how to collaborate to create value jointly. They came to recognize that trust in relationships will take root only if both parties share in the rewards and not just the risks. And ultimately they



incorporated those realizations into the fabric of the company's management systems.

To be candid, the steps that Chrysler took were not always by design. But through trial and error, the automaker has managed to develop supplier management practices that are a model of cooperation and efficiency.

The Impetus for Change

In the mid-1980s, as part of an effort to improve its competitiveness, Chrysler conducted an extensive benchmarking study of product development and manufacturing at Honda Motor Company, which was then expanding its manufacturing and sales presence in the United States faster than either Toyota Motor Corporation or Nissan Motor

Company. One factor that Chrysler studied was supplier relations.

Honda was organized into product development teams composed of individuals from all key functions, all of whom had cradle-to-grave responsibility for the development of a vehicle. The teams included suppliers' engineers, who had responsibility

Chrysler came to realize that trust takes root only if suppliers share the rewards, not just the risks.

for both the design and manufacture of a particular component or system. Executives from Chrysler thought initially that Honda's practices were interesting but completely foreign to Chrysler, which was organized by function and which developed products in a traditional sequential process that did not routinely in-



volve suppliers. Chrysler's engineers designed components, and suppliers built them. Whereas Honda selected suppliers that had a history of good relations with the company and a track record for delivering quality products and meeting cost targets, Chrysler selected suppliers that could build components at the lowest possible cost. (Buyers had to obtain quotations from at least three suppliers.) A supplier's track record for performance and quality was relatively unimportant. As a consequence, the typical relationship between Chrysler and its suppliers was characterized by mutual distrust and suspicion.

Honda's approach suddenly looked less foreign after Chrysler acquired the American Motors Corporation

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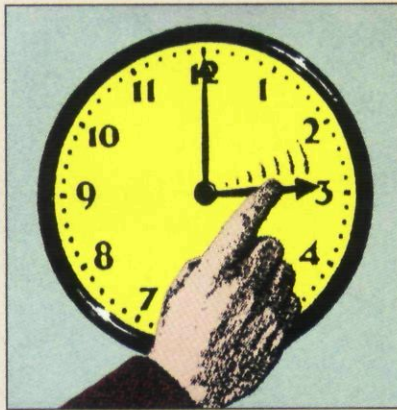
How Supplier Partnerships Helped Revive Chrysler

Partnerships with suppliers have helped Chrysler improve performance significantly by speeding up product development, lowering development costs, and reducing procurement costs, thereby contributing to increases in Chrysler's market share and profitability.

Shortening the Product Development Cycle. Company documents indicate that Chrysler has reduced the amount of time it takes to develop a new vehicle from 234 weeks (the average product-development cycle for new-vehicle programs in the 1980s) to 183 weeks for the LH program. The next version of the LH – scheduled for introduction in late 1997 – is on schedule to reach the target of 160 weeks from concept approval to volume production. Thus, since 1989, Chrysler has reduced the time it takes to develop a new vehicle by more than 40%. Also, Chrysler's productivity increased during the 1980s: whereas the automaker developed only four new vehicles between 1980 and 1989, it has already developed and introduced six new vehicles since 1990, without increasing the size of its total engineering staff.

Partnerships with suppliers have been essential to speeding product development. Under its old system, Chrysler devoted 12 to 18 months of the development process to sending out bids for quotations, analyzing bids, rebid-

ding, negotiating contracts, and bringing suppliers on board and up to speed. After selecting suppliers, Chrysler would have to spend additional time responding to problems they encountered when trying to manufacture a part they usually had not designed. Often suppliers did not even know they had won the business until 75 to 100 weeks before volume production. Under the new system, suppliers become involved at the conceptual



stage (about 180 weeks before volume production on the LH, Neon, and Cirrus/Stratus programs), giving them an extra 18 to 24 months to prepare for volume production and additional time to work out potential problems early in the process.

Reducing the Overall Costs of the Vehicle Program. The cost of developing and launching a new model can be divided into four categories: engineering, research,

and development (ER&D), which consists of the costs associated with designing and engineering a new vehicle; tools, such as dies and molds; facilities, such as new conveyors, presses, and welding lines in the plant; and preproduction and launch (PP&L) expenses, such as training and manufacturing preparation. For a typical Chrysler program, roughly 15% to 20% of total costs are in ER&D, 40% to 45% are in tools, 25% to 30% are in facilities, and 5% to 10% are in PP&L. Since 1989, Chrysler has been able to reduce overall program costs significantly. Before Chrysler adopted Japanese-style supplier partnerships, its investments in preproduction plants, equipment, and training, and its piece costs during production often ran 25% to 50% over budget.

By involving suppliers early in product development and giving them greater responsibility for design and manufacturing, Chrysler has sped up the product development process – and has needed fewer engineering hours per vehicle. For instance, ER&D costs for the LH program were roughly \$300 million (or 20% of the LH's \$1.6 billion program). By reducing ER&D time by 24% over previous programs, Chrysler saved approximately \$75 million in developing the LH. The company's 1998 LH model will save an additional 15% in ER&D over the 1993 model.

ration in 1987 for its profitable Jeep operations. AMC had implemented some Honda-like supplier-management and development practices. The reason was necessity. Because AMC had neither the resources to design all its own parts nor the power of larger automakers to dictate the prices it was willing to pay for them, it had learned to rely on suppliers to

engineer and design a number of its vehicles' components. Also, the engineering and manufacturing staff in AMC's Jeep and truck group had been operating for several years as an integrated team. With just 1,000 engineering employees, AMC had developed three vehicles between 1980 and 1987 – the Cherokee, the Premier, and the Comanche – and

was beginning a fourth, the Allure coupe. In comparison, Chrysler's 5,500 engineers and technicians had developed only four all-new vehicles during the 1980s: the K-car, the minivan, the Dakota truck, and the Shadow/Sundance.

AMC's operations suggested to Chrysler's executives that Japanese-style partnerships might be possible

Faster development cycles also have helped to reduce program costs because hard tools can be purchased closer to volume production. Chrysler now purchases hard tools approximately 50 to 60 weeks before volume production, as opposed to 75 to 100 weeks before, as it did when product development was slower. Thus the company saves up to 12 months of investment in hard tools. Given that 40% to 45% of program costs are in tools, Chrysler saved approximately \$60 million on the LH program by delaying the purchase of hard tools (assuming a conservative 10% cost of capital).

Chrysler also has saved money by reducing the number of changes in hard tools after they have been cut. Historically, the lengthy development process did not produce the first prototype until about 65 weeks before volume production. However, the lead time on many hard tools was more than 65 weeks, so work on hard tools had to begin before the first prototype was completed. When problems were discovered in the prototype, Chrysler had to ask for corrections to hard tools that already had been ordered. With the LH program, Chrysler involved suppliers earlier on; as a result, the first prototype was completed 24 weeks earlier than in previous programs – and hard tools were cut *after* Chrysler and its suppliers identified problems with the prototype. Also, because

Chrysler now has suppliers take responsibility for both the prototype and the volume production, it has been able to reduce time, communication problems, and incompatibility in the parts.

In fact, the overall cost to develop a new vehicle seems to be gradually declining at Chrysler. The LH program cost \$1.6 billion, the Dodge Ram truck cost \$1.3 billion, the Neon cost \$1.2 billion, and the Cirrus/Stratus cost less than \$1 billion. These costs



compare favorably with the development costs of similar models developed by GM and Ford. For instance, the Neon is similar to GM's Saturn (\$3.5 billion to develop) and Ford's Escort (\$2.5 billion). The Cirrus/Stratus is similar to Ford's Mondeo/Contour, which cost \$6 billion to develop, according to the *Economist* (April 23, 1994).

Reducing Procurement (Transaction) Costs. Since 1988, Chrys-

ler has reduced its number of buyers by 30% and has sharply increased the dollar value of goods procured by each buyer. Those results were made possible by reducing the number of overall suppliers (reducing search costs) and eliminating the competitive bidding system (reducing negotiation and contracting costs). In a presentation to suppliers in November 1994, purchasing chief Thomas Stallkamp requested that suppliers eliminate sales representatives altogether and shift those resources to engineering.

Increasing Market Share and Profitability. Because unit sales of vehicles increase substantially in both the United States and Japan after a major model change, automakers that develop new models more quickly than competitors can increase their market share. Chrysler's ability to produce more new models has contributed to its increased share of the U.S. car and truck market – 14.7% in 1994, up from 12.2% in 1987. This is Chrysler's highest share in the U.S. market in 25 years. Chrysler also has dramatically improved its profitability. Its return on assets, which throughout the 1980s tended to be lower than its competitors', has been the highest among U.S. automakers since 1992. Its profit per vehicle has increased from approximately \$250 in the 1980s (taking the average from 1985 through 1989) to \$2,110 in 1994.

in an American context. Equally important, that discovery occurred at a time when Chrysler's leaders had been made keenly aware that their development process was inadequate. The company's newly launched LH program (Chrysler Concord, Eagle Vision, and Dodge Intrepid – Chrysler's answers to Ford Motor Company's popular Tau-

rus) was running a projected \$1 billion over budget, and the company was in dire financial straits. It had a \$4.5 billion unfunded pension fund. Its losses were deepening: after closing three plants in 18 months during 1988 and 1989, Chrysler hit bottom, reporting a record loss of \$664 million in the fourth quarter of 1989. With the exception of the minivan,

its boxy cars appealed only to older buyers. Chrysler's executives knew they had to do something fast.

Some changes in top management helped. Lutz, who had become president of operations in 1988, championed the effort to adapt and apply the positive lessons learned from Honda and AMC. When Chrysler's

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Supplier-Management Practices at Chrysler Have Changed

Process Characteristics

1989	1994
Suppliers chosen by competitive bid –Low price wins –Selection after design	Suppliers presourced –Cost targeted to a set price –Selection before design, based on capabilities
Split accountability for design, prototype, and production parts	Single supplier accountable for design, prototype, and production parts
Minimal supplier investment in coordination mechanisms and dedicated assets	Substantial investments in coordination mechanisms and dedicated assets
Discrete activity focus; no process for soliciting ideas or suggestions	Focus on total value-chain improvement; formal process for soliciting suppliers' suggestions
Simple performance evaluation	Complex performance evaluation
Short-term contracts	Long-term contracts

Relational Characteristics

1989	1994
Little recognition or credit for past performance (transaction orientation)	Recognition of past performance and track record (relationship orientation)
No responsibility for suppliers' profit margins	Recognition of suppliers' need to make a fair profit
Little support for feedback from suppliers	Feedback from suppliers encouraged
No guarantee of business relationship beyond the contract	Expectation of business relationship beyond the contract
No performance expectations beyond the contract	Considerable performance expectations beyond the contract
Adversarial, zero-sum game	Cooperative and trusting, positive-sum game

chief engineer retired in 1988, Lutz replaced him with François Castaing, AMC's chief engineer. In one of his first moves, Castaing recommended that Chrysler slam the brakes on the LH program, and the company picked Glenn Gardner to rethink and relaunch the program. Gardner had been chairman of Dia-

darkly joked stood for "last hope." The reborn LH program was to serve as a pilot for redesigning Chrysler's product-development process and supplier relations.

To spur creativity and increase the speed of the product development cycle, the three executives made three important changes that broke

with tradition. First, to shield the team from internal bureaucracy, they decided to move it away from Highland Park, Michigan, where most of Chrysler's operations were located. Second, to speed decisions internal-

ly and to eliminate sequential decision making, they included on the team individuals from design, engineering, manufacturing, procurement, marketing, and finance. Finally, they decided to experiment with new methods of working with suppliers, drawing on the lessons learned from Honda, AMC, and Mitsubishi.

By 1991, Chrysler's senior managers knew they were onto something. The LH was being developed in record time and below the aggressive cost targets set at the beginning of the program. The new approach to product development and working with suppliers was extended to the rest of the company that year.

Chrysler's New Model

The model of supplier management that Chrysler now uses reflects several important changes in the company's processes for selecting, working with, and evaluating suppliers.

Cross-Functional Teams. To get its functions to present one face to suppliers and to end the conflicting demands and shifting priorities that had been the hallmark of its sequential development process, the company reorganized into cross-functional vehicle-development teams. It now has five cross-functional platform teams – one for large cars, one for small cars, one for minivans,

Lutz championed the effort to adapt and apply the lessons learned from Honda and AMC.

mond-Star Motors Corporation, Chrysler's joint venture with Mitsubishi Motors Corporation, and was familiar with Mitsubishi's product-development process, which was similar to Honda's.

Lutz, Castaing, and Gardner picked the team to develop the LH, a model code that many at Chrysler

one for Jeeps, and one for trucks. Cross-functional teams improve continuity, coordination, and trust both within Chrysler and between Chrysler and its suppliers. Suppliers also develop more stable relationships with Chrysler's staff and can count on the company to follow through more effectively on promises and agreements.

Presourcing and Target Costing. Presourcing means choosing suppliers early in the vehicle's concept-development stage and giving them significant, if not total, responsibility for designing a given component or system. The rationale for presourcing is that it permits many engineering tasks to be carried out simultaneously rather than sequentially, thereby speeding up the development process.

In addition to having responsibility for design, most presourced suppliers are responsible for building prototypes during development and for manufacturing the component or

system in volume once the vehicle is in commercial production. The new practice means that suppliers of such complex components as the heating and air-conditioning system join the product development effort very early and, as prime contractors, take total responsibility for the cost, quality, and on-time delivery of their systems. Suppliers say this approach gives them more flexibility in developing effective solutions to problems.

In the past, Chrysler had often given responsibility for design, manufacture of prototypes, and volume production of a component to separate companies, with the result being a lack of accountability. When suppliers had problems producing a component at the required cost or quality, they would often blame their troubles on the design – not

surprising, given that some studies have found that 70% of quality problems in automotive components are due to poor design. Consequently, Chrysler and its suppliers would

The rationale for presourcing is that it lets many engineering tasks be carried out simultaneously.

waste time trying to assign blame for problems when they could have been trying to solve them.

To overcome that fragmented approach, Chrysler had to move away from competitive bidding. For the LH project, Chrysler's corporate purchasing department gave the project's cross-functional platform team a prequalified list of suppliers considered to have the most advanced engineering and manufacturing ca-

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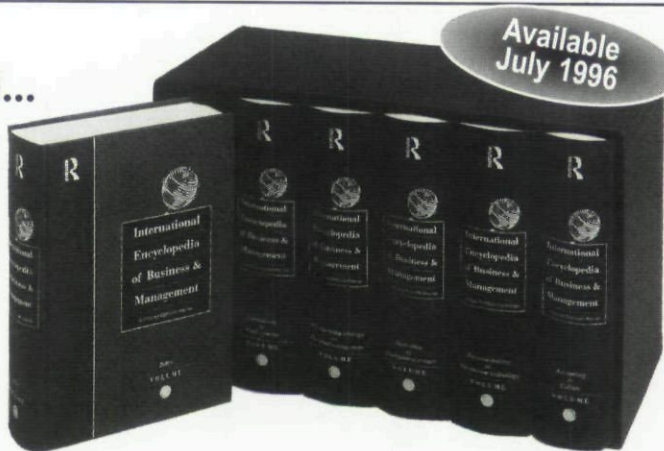
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Publication date: July 1996

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pabilities. That team, which included people from engineering, quality control, and purchasing, then selected suppliers on the basis of proven ability to design and manufacture the component or system. Each supplier's success in meeting design, cost, and quality targets and in delivering on time was critical to the success of the presourcing process.

The new process also required Chrysler to decide how to set a fair price for the component. Under the old competitive-bidding process, the price of a component or system was deemed fair because it was market driven. However, under the new system, Chrysler had to choose the supplier even before the component was

designed. Chrysler decided to adopt the widely used Japanese practice of *target costing*, which involves determining what price the market, or end customer, will pay for the vehicle and then working backward to calculate the allowable costs for systems, subsystems, and components.

How did the company set the initial target costs in the LH program? "Actually, we set them somewhat unscientifically and then, when necessary, had the suppliers convince us that another number was better," says Barry Price, Chrysler's executive director of platform supply for procurement and supply. "We would involve suppliers and tell them, 'I've got X amount of money.' We would

let them know what functions the part or system in question would be required to perform and ask, 'Can you supply it for that cost?' Usually, their response would be no, but they at least came back with some alternatives. The first time through, we had to find our way. The second time, we had the benefit of history and, as a result, we developed better targets at the outset of the program."

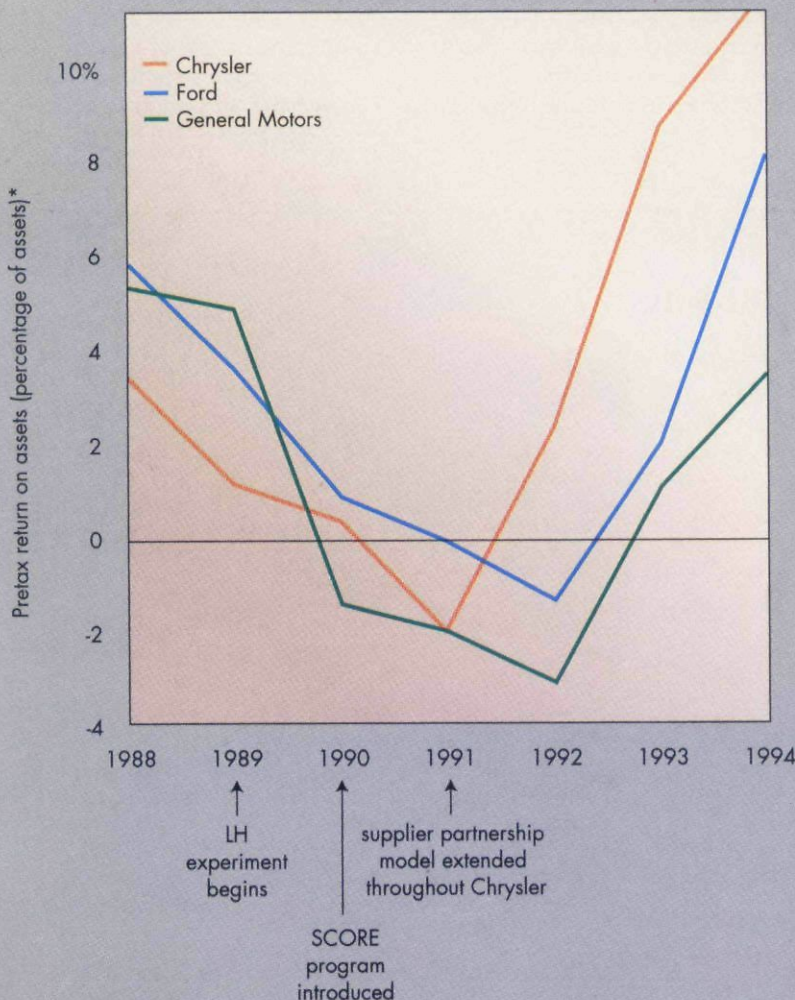
Target costing has shifted Chrysler's relationship with suppliers from a zero-sum game to a positive-sum game. Historically, Chrysler had put constant pressure on suppliers to reduce prices, regardless of whether the suppliers had been able to reduce costs; the automaker did not feel responsible for ensuring that suppliers made a reasonable profit. Chrysler's new focus on cost instead of price has created a win-win situation with suppliers because the company works *with* suppliers to meet common cost and functional objectives. Naturally, this process begins to build the trust that is critical if partnerships are to take root.

Total Value-Chain Improvement: The SCORE Program. The next step in building a partnership with suppliers is to figure out how to motivate them to participate in continuous improvement processes for the value chain as a whole. Eliciting the full effort and total resources of suppliers is critical because partnerships work only when both parties try to expand the pie. Such cooperation is possible only when the supplier trusts the buyer and when the two parties *really* communicate.

Chrysler began to build trust and improve communications with a small set of suppliers during the reborn LH program. However, it was another program, one that Chrysler began to develop in 1989, that became, almost by accident, the company's most important method for building trust, lowering costs, and improving communication. The formal name of that program now is the Supplier Cost Reduction Effort (dubbed SCORE).

Asking for Help. The basic purpose of SCORE is to help suppliers and Chrysler reduce systemwide

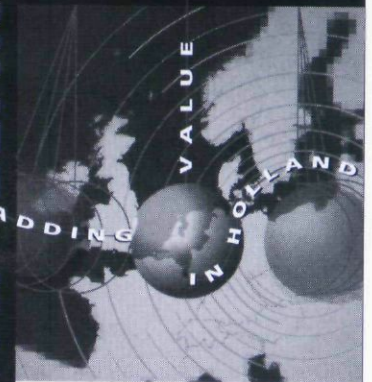
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costs without hurting suppliers' profits. The catalyst for the SCORE program was a speech that Lutz gave at the Detroit Athletic Club in August 1989 to executives from 25 of Chrysler's largest suppliers. Lutz told the suppliers that because of Chrysler's desperate situation, he wanted their assistance and ideas on how the company could lower both its own costs and those of its suppliers. The message was, "All I want is your brainpower, not your margins."

The fledgling efforts in the LH program to build tighter relationships with suppliers were bearing fruit, and Chrysler's leaders were eager to maintain the momentum. At the time, General Motors Corporation was increasing its squeeze on suppliers, demanding across-the-board price cuts. In his speech, Lutz wanted to stress that Chrysler was taking a different path.

The suppliers crowded around Lutz after the speech, eager to offer their ideas. Given Chrysler's history of adversarial relationships with suppliers, one might ask why they didn't react cynically to Lutz's request for help. For one thing, they knew that Chrysler was on the ropes. For another, Chrysler had four relatively new leaders who had demonstrated a commitment to radical change: Lutz, Castaing, Gardner, and Stallkamp, the purchasing chief who, in early 1990, had replaced a champion of competitive bidding. There also was hard evidence of Chrysler's sincerity: AMC and the relaunched LH program.

Lutz kept the ball rolling after the speech. He was so impressed with the suppliers' ideas and willingness to share information that he had senior executives schedule follow-up meetings with them. Some ideas were so good that Lutz, Castaing, and Stallkamp decided to establish a formal process for reviewing, approving, and implementing them.

To get advice on how Chrysler could accomplish that task more systematically, Lutz asked a small group of Chrysler's senior executives, including Castaing and Stallkamp, to visit a number of key suppliers. These unusual visits impressed the suppliers, many of

whom were upset with GM's heavy-handed treatment. (Chrysler would later strive to contrast its approach with GM's in order to drive home the point that Chrysler's path was different. For example, at a time when GM's purchasing czar, Jose Ignacio Lopez, was prohibiting his buyers from accepting a lunch invitation from a supplier, Stallkamp was instructing his buyers to take suppliers to lunch.)

During these talks, many suppliers complained about how GM was demanding that they reduce prices—a move that would require them to lower their costs—when, from their perspective, GM couldn't even get its own house in order. The suppliers noted that Chrysler, too, was far from perfect. Indeed, Chrysler had long been guilty of turning down or simply ignoring potentially money-saving suggestions from its suppliers—for instance, recommendations that they use a different material in a component—because the suggestions would have required running tests and making other changes in the component or in Chrysler's processes. In many cases, engineers refused even to consider such proposals, because considering them would have increased the engineers' workloads. Others were overly fearful of taking risks.

Unveiling SCORE. It was based on these discussions with suppliers that Chrysler established SCORE as a formal program that committed the automaker to encouraging, reviewing, and acting on suppliers' ideas quickly and fairly, and to sharing the benefits of those ideas with the suppliers. The SCORE program was unveiled in 1990 at a meeting with Chrysler's top 150 suppliers. To emphasize its desire to change, Chrysler specifically asked suppliers to suggest operational changes that it could make in its own organization to reduce both its costs and those of the suppliers. Chrysler soon received a large number of written suggestions.

Chrysler's executives knew that the initiative would fail if the company simply rejected all the ideas or did not respond quickly. So in another display of strong leadership,

Chrysler's top managers took personal responsibility for making sure that the company followed through on its promise to review and act on the proposals quickly. Castaing, Stallkamp, and other senior executives met once a month to review the proposals and evaluate Chrysler's responses. Initially, Chrysler's engineers wanted to reject many ideas, and senior managers had to decide when to overrule them. De-

Chrysler has enlisted suppliers' aid in reducing vehicle weight, warranty claims, and complexity.

termined to avoid a not-invented-here syndrome, Castaing forced through some of the ideas, pacifying the engineers by telling them to give the ideas a try simply as an experiment. Enough of the early ideas were accepted to convince suppliers that Chrysler really was open to suggestions. Soon the suggestions were pouring in, and the successes helped break down the engineers' resistance.

To get suppliers to buy into the SCORE program, Chrysler took three steps. First, it focused on what Chrysler itself was doing wrong. Second, it asked suppliers to make suggestions for changes that involved materials or parts provided by lower-tier suppliers—those that provided nonstrategic components or that supplied parts to key suppliers. Only as a third step did it turn to what the key suppliers—the ones that made strategic components or systems—were doing wrong. "The order with which we addressed these issues was important," Chrysler's Barry Price says. "The suppliers never would have gone for self-criticism before we developed a track record of correcting our own problems."

Why were suppliers willing to take the risk of expending resources to offer such ideas? The answer is that Chrysler made it profitable for them to participate in SCORE and demonstrated that it would play fair.

"For many, when we fixed our operations, they made huge savings," Price says.

Perhaps even more important, Chrysler offered to share the savings generated by the suppliers' suggestions with the suppliers. Partly because it did not have the resources to audit suppliers and partly to promote trust, Chrysler initially did not quibble when it suspected that a supplier was grabbing more than half. "That first time, we didn't ask for a renegotiation," recalls Price. "We just let them know that we knew. The result: we began to get more and more ideas—sometimes even on products they didn't supply." In one case, a supplier suggested

that Chrysler stop making a part out of magnesium and use plastic—an improvement that would cost the supplier the business. That suggestion saved Chrysler more than \$100,000 per year.

Beyond the incentive of improving their own profitability and increasing their business with Chrysler, suppliers appreciated being listened to for a change. Under the traditional system, suppliers were rarely asked for their ideas or suggestions for improvement; they were simply given a discrete task and asked to perform that task for a price. Performance expectations were explicitly written in the contract.

Incorporating SCORE. In 1992, Chrysler made SCORE a formal part of its supplier rating system. Chrysler began to *require* suppliers to offer ideas for improvement, to maintain a vehicle system focus, and to make every effort to improve the Chrysler "extended enterprise."

Now Chrysler keeps detailed records of the number of proposals each supplier makes and the dollar savings they generate, and it uses those figures—along with the supplier's performance in the areas of price, quality, delivery, and technology—to grade the supplier's performance. In 1995, a supplier's SCORE rating was 15% of its overall rating, up from 8% in 1994—an indication of how important continual im-

provement throughout its value chain is to the automaker.

Since February 1994, Chrysler has given suppliers specific annual targets for savings from SCORE ideas. Although Chrysler does not penalize a supplier if it misses a SCORE target, the supplier's performance over time may eventually determine how much business it receives from the automaker. Suppliers are expected to offer suggestions that result in cost reductions equaling 5% of the supplier's sales to Chrysler. The automaker also has expanded the program to enlist suppliers' assistance in reducing vehicle weight, warranty claims, and complexity. (Suppliers receive a \$20,000 credit for every part removed from a system.)

Chrysler also tracks the number of proposals awaiting a decision and the amount of time it takes to respond to a proposal. Although the job no longer falls to senior executives, Chrysler's managers continue to review engineers' evaluations of suggestions from suppliers. Managers also help suppliers with the SCORE paperwork and routinely intercede on the suppliers' behalf. In other words, the managers serve as the suppliers' advocates within the company. And to make submitting ideas even easier, SCORE is now an on-line process: a supplier can submit a proposal or check on its status at any time.

When Chrysler accepts a SCORE idea, the supplier has two choices: it can claim its half of the savings or it can share more of the savings with Chrysler in order to boost its performance rating and potentially obtain more business from the automaker.

To understand more clearly how SCORE works, consider the experience of Magna International. One of Chrysler's largest suppliers, Magna provides the automaker with seat systems, interior door and trim panels, engine and transmission systems, and a wide variety of other products. In 1993, Magna made its initial SCORE proposal, suggesting that Chrysler use a different wood-grain material on a decorative exterior molding on its minivan. The material Magna recommended cost less and offered the same quality as the

material Magna had been using. Magna documented the proposal on Chrysler's supplier-buyer information form and submitted it to the responsible Chrysler buyer. The buyer then notified engineering and requested its review and consent. The entire process took approximately two weeks. Chrysler approved the proposal, which resulted in annual savings of \$250,000. Since then, Magna has submitted 213 additional SCORE proposals, 129 of which Chrysler has approved—for a total cost savings of \$75.5 million.

Rather than taking a share of these savings, Magna has opted to give 100% of them to Chrysler in the hopes of boosting its performance rating and winning more business. The result: since 1990, Magna's sales to Chrysler have more than doubled, from \$635 million to \$1.45 billion. What is more, the greater economies of scale mean that the business with Chrysler is now more profitable, says John Brice, the Magna executive director in charge of the Chrysler account.

SCORE has been astoundingly successful. In its first two years of operation, 1990 and 1991, it generated 875 ideas worth \$170.8 million in annual savings to Chrysler. In 1994, suppliers submitted 3,786 ideas, which produced \$504 million in annual savings. As of December 1995, Chrysler had implemented 5,300 ideas that have generated more than \$1.7 billion in annual savings for the company alone.

Enhanced Communication and Coordination. Chrysler promoted cooperation both among suppliers and between suppliers and Chrysler in several ways. To coordinate communication with and across suppliers more effectively, the automaker has imitated the Japanese practice of employing *resident engineers*—suppliers' engineers who work side by side with Chrysler's employees. The number of resident engineers in Chrysler's facilities has soared from fewer than 30 in 1989 to more than 300 today. Executives at suppliers and at Chrysler claim that this practice has resulted in greater trust and more reliable and timely communication of important information.

To facilitate interaction with suppliers, Chrysler has taken a number of other steps, including the creation of a common E-mail system and the establishment of an advisory board of executives from its top 14 suppliers. In addition, it has instituted an annual meeting of its top 150 strategic suppliers and also holds quarterly meetings with each supplier to discuss strategic and performance issues and to review priorities for the coming year.

For their part, suppliers have demonstrated their trust in Chrysler by increasing their investments in dedicated assets—plant, equipment, systems, processes, and people dedicated exclusively to serving Chrysler's needs. In addition to the resident engineers, nearly all suppliers have purchased Catia (Chrysler's preferred CAD/CAM software), which at \$40,000 per engineer (seat) is no small investment. (To help them obtain a lower price for Catia, Chrysler arranged a large-scale group purchase for more than 200 suppliers.)

A number of suppliers also have invested in dedicated facilities to improve their ability to make just-in-time deliveries to Chrysler and to provide it with better service. For example, Textron built a plant dedicated to producing interior trim parts for the LH and located a new design facility less than two miles from the Chrysler Technology Center. Partly as a result of investments such as those, the average distance between Chrysler's assembly plants and its suppliers' facilities has been decreasing. At Chrysler's plant in Belvidere, Illinois, where the Neon is assembled, the number of supplier shipment points has dropped by 43% and the average distance from supplier to assembler plant has shrunk by 26 miles. My previous research has demonstrated that geographic proximity lowers inventory costs and enhances communication. (See my article "Dedicated Assets: Japan's Manufacturing Edge," HBR November-December 1994.)

Long-Term Commitments. To earn suppliers' trust and to encourage them to invest in dedicated assets, Chrysler is giving a growing

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number of suppliers increasingly longer commitments. The average length of the contracts held by a sample of 48 of Chrysler's suppliers on the LH program in 1994 was 4.4 years. By comparison, Chrysler's supply contracts lasted 2.1 years on average in 1989, according to a 1991 study by Susan Helper titled "How Much Has Really Changed between U.S. Automakers and Their Suppliers?" (Sloan Management Review, Summer 1991).

Today Chrysler has given oral guarantees to more than 90% of its

Ford and GM on all five dimensions (significantly higher than GM on all five and significantly higher than Ford on three of the five).

The American Keiretsu

The American keiretsu that Chrysler has created differs from a Japanese keiretsu in two major respects. First, Japanese manufacturers like Toyota and Nissan typically own 20% to 50% of the equity of their largest suppliers; Chrysler does not and could not take similar stakes. Toyota, for example, has only about 310 suppliers, and those with which it has equity ties, about 50, typically depend on it for two-thirds of their sales. So their destinies are closely intertwined. By comparison, Chrysler still has a much larger group of suppliers, and

few of its most important suppliers depend on it for a majority of their sales. Second, approximately 20% of the executives at Toyota's and Nissan's major supplier companies formerly worked for those automakers. This intimacy leads to a high level of understanding and a common culture that Chrysler could never duplicate.

However, Chrysler's arrangement has its advantages. It is much easier for Chrysler to drop underperforming suppliers than it is for Toyota or Nissan. Because those companies cannot drop suppliers so easily, they are under greater pressure to commit resources to help suppliers improve. This assistance almost certainly benefits rivals—including Chrysler—that buy from those suppliers.

Chrysler's formal programs that measure results and offer incentives for improvement ideas are probably more suitable for the U.S. business environment than the Japanese companies' relatively informal approach would be. One could argue that without formal programs such as SCORE, suppliers would not devote the same resources to generating ideas. As Stallkamp observes, "SCORE is a success because it is a communications program, not just

a cost-cutting program. By learning how to communicate, we've learned how to help each other." The level of communication needed to make a supplier partnership productive simply may not happen naturally in the U.S. business environment.

On the other hand, Chrysler's policies for building partnerships seem to be too successful in one sense: they appear to be making it harder for the company to continue to shrink its supplier base, which it would like to do to reduce coordination costs, improve quality, achieve even greater economies of scale, and, last but not least, strengthen its ties with the suppliers it retains. The shrinkage rate has slowed. Chrysler still has almost four times as many suppliers in the United States as Toyota does in Japan.

In addition, Chrysler still lags far behind its Japanese competitors in converting lower levels of its supply chain to the new supplier-management approach. Its biggest suppliers are only beginning to replicate programs such as presourcing, target costing, and SCORE in their own supply chains.

Even if Chrysler has a long way to go, the progress it has made in the last seven years is nonetheless remarkable. Its success to date in building an American keiretsu—or, as its leaders prefer to call it, Chrysler's "extended enterprise"—proves that decades of adversarial relations can be overcome. As Steve Zimmer, Chrysler's director of operations and strategy for procurement and supply, notes, "We've learned that you don't have to be Japanese to have a keiretsu-like relationship with suppliers." Chrysler has proved that highly productive partnerships with suppliers not only can flourish in the United States but are the wave of the future.

The author would like to thank the Reginald H. Jones Center for Management Policy, Strategy, and Organization at the Wharton School and Michigan Future for their support of this research. He would also like to thank Thomas Stallkamp and the many others at Chrysler who assisted him.

Reprint 96403

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More than 90% of Chrysler's suppliers are assured of business for the life of the model and beyond.

suppliers that they will have the business for the life of the model they are supplying and beyond. Of course, the suppliers must fulfill one condition: they must perform well on the current model and must meet the target cost on the next. "The business is theirs to keep forever or until they elect to lose it," Stallkamp declares.

Suppliers make it clear that Chrysler's longer-term commitments are having the desired effect. "I would certainly say that we are more comfortable making investments and taking risks on behalf of Chrysler than on behalf of our other customers, with whom we have a less secure long-term future," says Ralph Miller, CEO of auto supplier APX International.

Surveys conducted for Ford and Chrysler in 1990, 1992, and 1993 by Planning Perspectives, an independent market-research company, confirm that Chrysler has made tremendous strides in developing cooperative, trusting relationships with its suppliers. In 1990, suppliers rated Chrysler lower than both GM and Ford on five key dimensions, including trust, responsiveness to ideas, and efficiency. By 1993, suppliers rated Chrysler higher than

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