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NEW UNITED MOTOR MANUFACTURING, INC.

UNITED STATES BANKRUPTCY COURT
SOUTHERN DISTRICT OF NEW YORK

In re **MOTORS LIQUIDATION COMPANY, *et al.*, f/k/a General Motors Corp., *et al.*** **Debtors.**	Chapter 11 Case No.: 09-50026 (REG) (Jointly Administered) **DECLARATION OF MARK E. McKANE IN SUPPORT OF INITIAL RESPONSE TO THE DEBTORS' OBJECTION TO PROOF OF CLAIM 67357 FILED BY NEW UNITED MOTOR MANUFACTURING, INC.**

I, Mark E. McKane, hereby declare as follows:

1. I am a partner at Kirkland & Ellis LLP, attorneys for Claimant New United Motor Manufacturing, Inc. I am licensed in the State of California, the State of Illinois, and the District of Columbia and am duly admitted to practice before this Court. I have personal knowledge of the facts set forth herein, except as to those stated on information and belief, and, as to those, I am informed

and believe them to be true. If called as a witness, I could and would competently testify to the matters stated herein.

2. Attached hereto as Exhibit A is a true and correct copy of a February 12, 1982 article in the *New York Times* titled "G.M. Shutdowns To Lay Off 26,200."

3. Attached hereto as Exhibit B is a true and correct copy of a September 25, 1982 article in the *New York Times* titled "Retraining Accord Reached On Coast."

4. Attached hereto as Exhibit C is a true and correct copy of a November 14, 1982 article in the *New York Times* titled "General Motors: A Giant In Transition."

5. Attached hereto as Exhibit D is a true and correct copy of an April 30, 1990 article in the *San Jose Mercury News* titled "GM's Hard Lessons."

6. Attached hereto as Exhibit E is a true and correct copy of an article in the *Automotive News* (Vol. 71, No. 5763, April 27, 1998) titled "NUMMI Stint Helps Hogan Think Small."

7. Attached hereto as Exhibit F is a true and correct copy of a September 3, 1999 article in the *San Jose Mercury News* titled "NUMMI Now and Next: Analysts Predict Sport-Utility Or Hybrid Wagon Might Be Future Product At Fremont Plant."

8. Attached hereto as Exhibit G is a true and correct copy of an August 1, 2001 article in the *Detroit Free Press* titled "GM Executive Gives Toyota Credit For Improving Detroit Firm's Quality."

9. Attached hereto as Exhibit H is a true and correct copy of an April 6, 2004 article in the *Tri-Valley Herald* titled "GM, Toyota Maintaining Success."

10. Attached hereto as Exhibit I is a true and correct copy of an article in the *California Management Review* (Vol. 47, No. 4, Summer 2005) by Andrew C. Inkpen titled "Learning Through Alliances: General Motors and NUMMI."

11. Attached hereto as Exhibit J is a true and correct copy of a June 19, 2009 article in the *Grand Rapids Press* titled "GM Kills Vibe Brand: Automaker Will Quit Making Hatchback In August."

12. Attached hereto as Exhibit K is a true and correct copy of a June 29, 2009 Associated Press article titled "GM Ends Joint Venture With Toyota At Calif. Plant."

I hereby swear that the foregoing is true and correct.

May 24, 2010
San Francisco, California

/s/ Mark E. McKane
Mark E. McKane

Exhibit A

The New York Times
nytimes.com

February 12, 1982

G.M. Shutdowns To Lay Off 26,200

REUTERS

The General Motors Corporation said it will temporarily close seven of its 29 domestic car and truck plants next week and will add another facility to the list of plants to be closed during the week of Feb. 22.

General Motors said the closings will put 26,200 employees out of work. The auto ma ker said that its assembly line shutdowns at eight plants during the week of Feb. 22 will raise the number of workers on temporary layoff to 31,100. The company said it has 140,000 workers on in definite layoff.

Exhibit B

The New York Times
nytimes.com

September 25, 1982

RETRAINING ACCORD REACHED ON COAST

SPECIAL TO THE NEW YORK TIMES

The General Motors Corporation, the United Automobile Workers and the State of California joined Thursday in announcing a $10 million training program designed to enable 8,400 unemployed auto workers in California to find new jobs.

The cost of the program, which includes counseling, retraining and placement, will be shared by the company, the union and the Federal and state governments. General Motors and the union will contribute $4 million, a result of negotiations conducted earlier this year, and the state and Federal governments will put up $6 million.

The California agreement is a pilot program for similar ventures in other sections of the country hit hard by layoffs or plant closings. About 5,400 workers at a General Motors plant in Freemont and 3,000 at South Gate were laid off last March, when the company closed assembly plants there.

At a time when many economists are saying employees should be retrained in other skills rather than trying to prop up the nation's sagging auto industry, participants in the program say they believe it will ease the plight of the 142,000 auto workers who have been laid off throughout the country.

Owen Bieber, vice president of the auto workers and director of the union's General Motors department, said, "We hope to be putting these retraining programs into other areas where we have a high concentration of unemployment, like Detroit, Georgia and Massachusetts." 'A Good Place to Start'

"With a downturn of the market that has grown more severe, we decided to spend some money on a pilot program," said Al Warren, president of industrial relations for General Motors. "There are similar situations in other parts of the country, and with two plants closing here, it seems a good place to start."

Gera Curry, director of the state's Employment Development Department, said that the goal was to "get these people trained and into areas where there is a demand and where we anticipate openings."

"We are looking at positions for machinists, auto mechanics who are skilled in smog control device installment, aerospace equipment builders, data processors - wherever industry is willing to work with us," she added.

Courses for the program, which are expected to begin in November and run in four phases until December 1983, will be held at community colleges, regional occupation centers, the State Department of Education and wherever else local government decides, Mrs. Curry said.

Mr. Bieber said that "a number of people have already been interviewed, and many others are already signed up." He added that the program's organizers hoped that at least half of the 8,400 eligible workers would participate in the first training session, and that all of those eligible would be in training by next June.

Exhibit C

11/14/82 N.Y. Times 676
1982 WLNR 305878

New York Times (NY)

November 14, 1982

Section: 6

GENERAL MOTORS: A GIANT IN TRANSITION

John Holusha

John Holusha is chief of the Detroit bureau of The New York Times.
The robot arm bowed to the chairman of the General Motors Corporation, Roger B. Smith, then swung around and did the same to Dr. Seiuemon Inaba, the president of Fujitsu Fanuc Ltd. Turning again, the unmanned machine reached forward, electric motors humming, and neatly snipped a ribbon in two, ceremonially opening the Troy, Mich., headquarters of the GMFanuc Robotics Corporation, the new company that G.M. hopes will become as prominent among industrial robots as G.M.'s Chevrolets once were on highways.

The June event went largely unnoticed outside the Detroit area, but it said a lot about the state of General Motors, the world's largest industrial corporation, in this third year of the worst recession the automobile industry has endured since the Great Depression. The immense success of the Japanese automobile companies in producing high-quality, low-cost cars - every fourth car sold in America is made in Japan - is forcing G.M. to re-examine the way its does business and is pressuring it to diversify into products other than motor vehicles. Initially, GMFanuc's robots, which should be rolling off the assembly line in the United States sometime in 1984, will be used for auto production at G.M. plants and in other factories, but the company also envisions selling them to other industrial users. "We will be coming up with new products," Roger Smith said during a recent interview. "I predict they will be highly sophisticated, very technologically oriented. We won't be making hula hoops."

In addition to robots, the small computers that now regulate the engines on all G.M. cars will be adapted to other applications, possibly for use on familiar consumer products. "We may make the first electronic, automatic vacuum cleaner," Mr. Smith continued. "You walk out the door in the morning and at 11 o'clock this thing comes out and vacuums the whole house while you're gone."

Ten years from now, G.M. may be the American affiliate of a worldwide automobile combine dominated by the Japanese or it may be as important in robots and computer controls as it once was in tail fins and chrome. Where the industrial giant finds itself in the next decade depends in large measure on the skill and efforts of Roger Smith, the company's 56-year-old financial manager and undisputed overall boss.

When Mr. Smith, who bears an uncanny physical and vocal resemblance to the comedian George Gobel, speaks enthusisatically about robots and computer-controlled appliances, to a large extent he is making a virtue of a necessity. With their advanced production techniques and $1,700-a-car lower production costs, the Japanese car manufacturers have virtually assured that G.M. will not for a long time to come, if ever, earn the profits from automobiles which it did

in the past.

At least a partial explanation of how G.M. finds itself in its present predicament surfaces in a comment by Robert A. Frosch, a former administrator of the National Aeronautics and Space Administration who is now vice president in charge of G.M.'s research laboratories. "As a nation, we fell into the hands of the fast-buck artists," Mr. Frosch said recently. "There was a tendency to worry about the business side rather than the product or the technology side. Now, in the past three years, there is a great rediscovery of technology."

At this point in its 74-year history, General Motors is a giant in transition, scrambling to change from a sluggish, virtually oneproduct company dominating an isolated market, to a more diversified, more efficient organization. The recent three-year depression in car sales produced the first red ink in G.M.'s modern history in 1980, when GM 1st JUMP it lost $762.5 million. Neverthless, G.M. has been spending billions retooling its factories to produce an alphabet soup of new, more fuel-efficent cars - the "X," "J" and "A" models. The results have been mixed, with scant evidence that buyers are being wooed away from imports.

Under this intense pressure to adapt to new conditions, much of the company's fabled arrogance has been replaced by a sort of pragmatism-under-fire. G.M. engineers are diligently studying Japanese factories to see what they can copy or adapt, while company executives are lining up deals with Japanese auto companies, such as the recently consumated ones with the Suzuki Motor Corporation and Isuzu Motors Ltd. for rights to import minicompact cars G.M. cannot economically produce in its own facilities.

Additionally, G.M. has been working on a deal with the Japanese giant, Toyota Motor Company, to build a Toyota-designed car in one of G.M.'s shut-down West Coast assembly plants, probably in Fremont, Calif. Under the proposed arrangement, Toyota would supply the necessary tooling and manage the plant. G.M. has conceded that it cannot match the Japanese at the small-car game and has apparently decided, with admirable hardheadedness, that if you can't beat them, join them. It is a historic concession for G.M., which has long followed the dictum set down by Alfred P. Sloan, who for almost 40 years was the dominant influence at G.M., of producing "a car for every purse and purpose." If the car business had not been so lucrative in the past, G.M. might already have had its own robot for every purse and purpose. It had a primitive robot in operation as early as 1961 and the specifications for some of the earliest assembly robots were developed at G.M. in the mid-1970's. "We said robots were the coming thing then," says one G.M. development engineer, who prefers to be anonymous. "But the attitude then was, 'We make cars, not tools.' "

Roger Smith, the G.M. chairman, admits that the Japanese made better use of American technology than did its originators, who would have laughed had anyone suggested that the foreign manufacturers to whom they sold their inventions would some day become their competitors. "Computer-aided design, numerically controlled robots, all that was developed here at General Motors," emphasises Mr. Smith. "We did not choose to go into the manufacture of them then. In hindsight, we probably should have." He put it somewhat more bluntly in what amounted to a pep talk to the company's 500 top exectives. Speaking of the Japanese, Mr. Smith declared: "Never again can we let them take our technology and beat us at our own game."

Douglas A. Fraser, president of the United Auto Workers union, who has been observing G.M. for most of his life, finds the company's leadership noticeably changed by the trauma of the past three years. "They thought they were just about infallible," says Mr. Fraser. "They had talent in depth. They have an extremely good system, and it worked. But they have never had to face the adversity they are facing now. The only rewarding feature of all this is that it has served to humble them, and I think that's healthy."

A former Chevrolet executive who now works for another automobile company in the Detroit area puts it more subtly: "When I go to parties, G.M. people just don't seem to stand as tall as they used to."

GMFanuc Robotics Corporation, an equal partnership with Fujitsu Fanuc, whose name has since been shortened to

Fanuc Ltd., one of Japan's leading robot producers, is symbolic of the new pragmatism at General Motors that may help G.M. executives to regain their lost height advantage. It is the first domestically based joint venture in which G.M. has participated in more than 40 years. Until recently, if G.M. wanted something, it bought it or invented it on its own.

Now it wants a big piece of what GMFanuc's president, Eric Mittelstadt, says some estimate will by 1990 be a $1 billion to $5 billion-a-year robotics industry in the United States, an industry that other American auto manufacturers, strapped for funds, have yet to enter. G.M. linked up with Fanuc because it needs the Japanese company to supply relatively simple, moderately priced robots while G.M. itself develops more sophisticated systems, such as the N/C (numerically controlled) multiple robot system, a completely automated painting system now being installed in its plants.

"It's a matter of timing. G.M's strength is in the high technology area of specialty systems," says Mr. Mittelstadt. "When we decided to go into the robotics business, we realized we needed a broader line of products. In order to get that broader line quickly enough to be effective, we felt we needed a partner." So the Chevrolets and Pontiacs of GMFanuc's robot line will come from Japan's three plants, while G.M. works on the Buicks and Cadillacs in an as-yet-undesignated plant in the United States. As part of the process of introducing new models of cars and trukcs, G.M. is gutting its existing plants and installing the robotic equipment. On the 14th floor of General Motors's world headquarters building in Detroit, where top executives work behind two sets of locked and guarded doors, there is more than a little defensiveness about the current situation. "The most comfortable positon for anybody to be in is hindsight," says F. James McDonald, the former foundry engineer who has been president and chief operating officer of G.M. since early last year. Among the younger executives, the men in their mid-to-late 40's who are the next generation of leadership, there is, however, a willingness to admit that mistakes have been made. William E. Hoglund, head of G.M.'s Pontiac division and one of the fast-rising names in the company, argues that G.M. was as good as it had to be until the Japanese raised the stakes. "You can't fight history," Mr. Hoglund says. "The opening of international borders has brought some competition in here that has brought new standards of quality and productivity. But operating under the environment at the time we did, I think we operated as rational businessmen."

With the benefit of hindsight, G.M.'s bosses probably would have done a lot of things differently. After the second oil crisis in 1979, it became clear that the 18-foot-long, 4,000 pound "fullsize" cars that were Detroit's specialty were fast becoming obselete. G.M.'s response was to announce a five-year, $40 billion plan to completely redesign all its cars and retool its plants to make more efficient cars more efficiently. Thomas A. Murphy, then G.M. chairman, described it in Olympian terms as "the most ambitious product and facility improvement program ever undertaken by any corporation in the world at any time in history."

The variety of new cars would be staggering, ranging from minicompacts with tiny 3-cylinder engines to full, six-passenger family sedans. There would be electronic engine controls, front-wheel drive and smooth, gearless automatic transmissions. An industrial renewal that would normally take the better part of a generation would be carried out in five years and, for the most part, it would be done in the United States. While other automakers were looking overseas for lower labor costs and already developed components, G.M. was confident that its technical prowess and financial muscle could do the job at home. That, of course, was before it learned the true dimensions of the advantages enjoyed by the Japanese.

James E. Harbour, who had spent 23 years in obscurity at the Chrysler Corporation as a manufacturing engineer, gained insight into those dimensions in 1980 when he left to establish his own consulting firm and began studying Japanese production costs in detail. Mr. Harbour found that the Japanese had managed to combine advanced production techniques, labor-management cooperation and lower wage rates to produce and ship a typical subcompact car to the United States market for $1,700 less than could American manufacturers of cars made in the United States. Harbour also found that the higher pay of American workers was only a relatively small part - about $550 - of the cost gap, and a large part of that amount was due to the Japanese ability to put a car together with 60 hours of labor compared with about 120 hours in the United States.

Here is how Mr. Harbour, whose study was cited in Transportation Secretary Drew Lewis's May 1982 report on the auto industry, breaks down the Japanese manufacturing cost advantage on a typical subcompact car: more advanced technology, $73; better quality control, $329; lower parts inventories, $550; better materials handling, $41; better use of labor, $478; lower absenteeism, $81; different assembly-line relief systems, $89, and lower union representation cost, $12. The result, after adding in the labor cost advantage, is that the Japanese have figured out a way to make a car for $2,203 less than the American companies who taught the world how to mass produce. Shipping, handling and import duties reduce the advantage by $585, leaving the Japanese with an advantage of $1,718. The recent decline in the value of the yen in terms of the dollar has only magnified the Japanese cost advantage.
GM 2d JUMP Since many American car buyers have been willing to pay over sticker price to get a high-quality Japanese car, the Japanese have kept their prices high and pocketed the profit. As Transportaion Secretary Lewis pointed out, the Japanese "have used the knowledge that they can underprice competing U.S. models if necessary and still enjoy handsome profits." It was an ominous message for G.M., which remained concentrated in the United States market while its archrival, Ford, successfully established itself in markets overseas that are protected aganst the full impact of the Japanese onslaught. Even if G.M. can produce cars with Swiss-watch quality appeal, the Japanese could always lower their prices. "The fact that a group of competitiors ... has the potential for substantial price reductions places a serious restriction on the ability of the U.S. manufacturers to expand their domesic market share or to increase exports," Mr. Lewis said. In their public appearances, the top executives of General Motors present a conservative appearance and often adopt a rural, folksy manner. None of them are cigar puffing, blunt-talking, slightlylarger-than-life versions of Lee A. Iacocca, Chrysler's chairman of the board and chief executive officer. The G.M. system puts an emphasis on team play; it does not encourage eccentricity. So it comes as something of a surprise for an outsider to find that G.M. executives consider themselves heroic figures - the economic equivalent of daring military commanders who are dispatching billions of dollars and hundreds of thousands of employees in high-risk counterattacks on the automotive battlefield.

"I think the fact that we have committed $9.7 billion in 1981 to establish our 1983, '84, '85 product programs takes a lot of guts," says G.M.'s president, F. James McDonald. "It takes a lot of guts to lay out your program and say, 'Hey, we're not going to wait until the market turns around; we're saying the markets are going to be outstanding, and we're going to compete in them.' We want to be No. 1."

One of G.M.'s major offensives was the "J" car, introduced in the spring of 1981. The company uses letters of the alphabet to denote cars that are essentially the same, although sold under differing names. The "J" car carried the strategy of commonality to its logical extreme: It is the first car to be sold by all five of G.M.'s automotive divisions, as the Chevrolet Cavalier, Pontiac J2000, Oldsmobile Firenza, Buick Skyhawk and Cadillac Cimarron. Smaller and with better fuel economy than the "X" body cars (G.M's first front-wheel drive compacts), the "J" cars were aimed squarely at the Japanese. Brimming with Detroit's institutional optimism, sales executives allowed as how they hoped to sell a million cars the first year.

They didn't come close. After being introduced in May 1981 to the accompaniment of an advertising blitz, only 249,871 had been sold by May 1982. Financial analysts estimate that G.M. has spent $2.5 billion so far on the "J" car, without making any notable inroads on Datsun or Toyota or any other Japanse makes. G.M. is now halfway through its new model program with three series of modern, frontwheel-drive cars in its showrooms, as well as its sleek, new Pontiac Firebird and Chevrolet Camaro sporty cars, yet its share of the American market has not edged much above the 45 percent it has held for the last decade. (G.M. men are quick to point out that the enormous growth of the imports, from 15.22 percent of the market in 1971 to 28 percent last year has come almost completely at the expense of Ford and Chrysler.)

There is a sense of confusion about what consumers really want. "This is the first time since I've been in the automobile industry that we haven't had a fix on the market," said William Lane, sales manager for Pontiac, at this year's Chicago auto show. Robert C. Stempel, general manager of G.M.'s Chevrolet division, recalls one young sales executive blurting out in frustration, "What in the hell is going on out there?"

One of the things that's going on out there - defined as anywhere outside Detroit or Bloomfield Hills, the affluent suburb that is home to most of G.M.'s top executives - is that Americans seem to be changing their attitude toward cars, looking at them more as transportation appliances than dream machines. Americans used to sing about cars, from the celebration of mobility ("In My Merry Oldsmobile") in the early years of the century to the 1960's muscle-car fantasies of "Little GTO." Lately, there haven't been many songs about cars. Americans seem less impressed by annual model changes and more willing to hang on to the old rust bucket. The average age of the car on the road today is 7 years old compared with 5.7 a decade ago.

It is ironic, says Mr. Stempel, that as the American affair with the automobile has cooled, the variety of mechanical temptations available has increased. Because of the imports and rapid change in domestic products, car buyers have more choices than in Detroit's golden era of the 1950's and 60's. They can buy models with four-, six- or eight-cylinder engines, diesel or gasoline powered, turbocharged or normally aspirated, front- or rear-wheel drive. Convertibles have returned. Small pickup trucks have all the comforts of luxury cars. Eventually, of course, the field will narrow, as low-selling designs are phased out. And looming over the whole industry is the uncertain outlook for fuel prices. "I'd sure like to know which way it's going to go," says Mr. Stempel, "so I can decide what to invest in and what to shut down." Meanwhile, the automobile industry in the United States is reeling: American Motors has become an effective subsidiary of the nationalized French company Renault; Chrysler needed $1.2 billion in federally backed loans to survive; Ford is being supported by its overseas operations. General Motors, which made money throughout the Depression, had a loss in 1980 and its $333.4 million profit last year was more the product of artful bookkeeping than automobile sales. (This year, industry analysts expect it to make about $1 billion.)
GM 3rd JUMP As it has struggled to retool its plants and bring out new models of cars in spite of anemic sales, G.M.'s financial health has weakened. Working capital dropped $5.6 billion in 1980 and 1981 and the company was stripped of one of the prized corporate badges of honor, its AAA credit rating. G.M. now has to pay more than $1 billion in interest each year and over the next three to four years will have to pay back about $3 billion in long-term debt - the equivalent of an entire new line of cars or trucks. Confronted with this financial weakness and the production-cost advantages of the Japanese, Mr. Smith and his colleagues have been forced to toss parts of their grand plan onto the scrap heap.

G.M.'s switch from a macho, go-it-alone approach to car making to one of cooperation in areas where it needs help, along with the company's plans to diversify and make products other than cars, is being interpreted as a sign that Mr. Smith is pragmatic enough to rewrite the formulas of the past. Maryann N. Keller, a widely followed Wall Street stock analyst, last spring recommended that her customers buy G.M. shares, "based on our assesment that G.M.'s present management is fundamentaly altering the company."

The arrangements with the Japanese are also prompting something of a positive re-evaluation of Mr. Smith's leadership, after some notable public stumbles during his first year and a half as chairman. Shortly after taking over as G.M.'s chairman on Jan. 1, 1981, Mr. Smith raised car prices, only to be forced to offer rebates a few months later. Fairly or unfairly, he has been blamed for the early flop of the "J" cars.

Negotiating in secret with the United Auto Workers' president, Douglas Fraser, Mr. Smith came up with a plan that would have tied concessions by union workers to lower car prices. When the agreement was announced early this year, G.M.'s car sales nearly ground to a halt as prospective buyers waited for the price reductions that never came because rank-and-file G.M. workers balked at the company's demand for a $5-an-hour cut in pay and benefits. Nor was his public image burnished when he announced that all G.M. white-collar employees would sacrifice equally to finance a rebate program and then said that his share would be $135 a month, out of a salary that last year amounted to $475,000.

There were some in the industry who questioned the wisdom of choosing Mr. Smith, a financial man who has never participated in the design or engineering of an automobile, to lead General Motors at a time when the company's basic product is undergoing such basic change. Tension between engineers and marketing specialists, the socalled "car men," and financial experts, derided as "bean counters," are endemic in the automobile business. At G.M., the finan-

cial men ususally come out on top.

Hard work and long hours are another Detroit tradition, and Mr. Smith is no exception. He routinely puts in 10-and 12-hour days that begin at 6:30 A.M. when a chauffer-driven car picks him up for a 7 o'clock breakfast meeting at the G.M. building with his top aides. He often remains at his desk until after dark. His is not an untypical schedule in the fiercely competitive car business. Mrs. Gerald Greenwald, the wife of Chrysler's vice chairman, once observed that "being an automotive wife prepares you for divorce or widowhood. One just learns to live independently."

Behind Mr. Smith's desk sit three fat briefcases. One, he explained to a visitor, is for things to be read at home, one for matters to be dealt with at the office and one for reading in the car. The car briefcase has one notable difference from the others; it doesn't contain any financial reports. Mr. Smith, who took extra differential-equations courses in college to increase his grade average, says he finds it hard to analyze columns of numbers in a moving car. It will evidently take more than hard work to overcome one of the most serious problems facing facing G.M: the alienation of a large proportion of its more than 300,000 blue-collar workers in this country. The company's new union contract, which went into effect last March and runs to September 1984, barely won rank-and-file ratification with a 52 percent majority, in contrast to the 73 percent margin at Ford. And the company has been less than successful in squeezing out concessions at the plant level, one of the major provisions of the new agreement. Only about 40 of the company's 117 plants approved the work rule changes the company requested.

Perhaps it is G.M.'s size or the impersonal nature of its system, but assembly-line workers seem more hostile toward G.M. than other auto companies. In Detroit, factory workers refer to the No. 2 automaker as "Ford's," as if it were still Henry Ford's family company. At G.M., a visceral hostility toward the company made it difficult for union leaders to sell the new agreement, even though it meant increased job security. "There's no doubt about the attitude of our members toward G.M.," Douglas Fraser says. "They view them as rich, even when they aren't rich, and arrogant."

When a new, more lucrative bonus plan, which would have established a $60 million-a-year fund to be divided among the 500 top executives, jeopardized relations with unionized workers who had made wage and benefit concessions in their new contract this year, the company backed down and suspended the new bonuses until the union contract expires.

The deals with the Japanese, applauded as they have been by the financial community, have only aggravated long-standing suspicions that G.M. looks upon its employees as an expendable factor of production. "You know, you can't trust G.M., says Lawrence E. (Red) Connor, president of the U.A.W. local at G.M.'s Wilmington, Del., assembly plant. "They have no loyalty to any country or anybody," he added in a reference to G.M.'s interest in going any place where labor costs are cheaper. Labor relations have improved at some G.M. facilities, notably at the "home" plants of the Buick and Pontiac divisions, but, on the whole, they appear worse than at the other United States auto companies, a serious problem at a time when employee involvement is seen as the key to improving product quality.

Tomorrow's cars will be small, but sophisticated. Engineers are working now on radar-controlled brakes that will stop a car automatially if it is about to hit something and controllable suspensions able to shift from a limousine ride to sports-car handling at the flick of a button. Rapid technological advance may give G.M. a chance to pull ahead of the Japanese, whose greatest ability has been efficient, high-quality application of existing techniques.

Maybe it will all work. Maybe, with the help of workers who want to preserve wages that are among the highest in the nation, with automation, with renewed attention to quality, with an end to the recession, American will flock again to G.M. showrooms. But the golden age of General Motors, the 1950's and 60's, when growth was boundless, when energy was cheap, when longer, lower and wider cars were the symbol of success in life, is forever gone. Arvid Jouppi is one of the sages of Detroit, an auto-industry analyst who drives a 1971 Oldsmobile 98 with 144,000 miles on it. "General Motors peaked out in 1966," he says. "Since then it has been struggling with consumerism, government regulations, higher gasoline prices and the surge of imports."

Alfred P. Sloan molded General Motors in the 1920's, developing the "full line" of cars, from Chevrolet to Cadillac, as well as the annual model change, and set the company on a course that was not deviated from for 50 years. Now, beset by a weak economy and the Japanese, G.M.'s present chairman, Roger Smith, has been forced into change. Observes Mr. Jouppi: "Ten years from now we may look back and say Roger Smith was the second Sloan."

The alternative is clear. If General Motors. along with the rest of the American automobile industry, does not regain its competitive vigor it will either collapse before the Japanese onslaught or become like Britain's once-proud auto industry, a sickly ward of the state kept alive at taxpayer expense to preserve the jobs of workers who have nowhere else to go.

Illustrations: Photo of GM Chairman Roger B. Smith

---- INDEX REFERENCES ---

COMPANY: RENAULT (REGIE NATIONALE DES USINES) SA; FANUC LTD; GENERAL MOTORS CORP; TOYOTA MOTOR CORP; DAIMLERCHRYSLER AG; SUZUKI MOTOR CORP; ISUZU MOTORS LTD

NEWS SUBJECT: (Forecasts (1FO11); Major Corporations (1MA93))

INDUSTRY: (Manufacturing Technology (1MA83); Software (1SO30); Application Software (1AP32); I.T. in Manufacturing (1IT56); Manufacturing (1MA74); Small Electrical Appliances (1SM28); Automotive Technology (1AU48); Transportation (1TR48); Automotive Factory Automation (1AU78); Home Appliances (1HO19); Trends in Technology (1TR23); Software Products (1SO56); Manufacturing Execution Systems (1MA30); I.T. in Consumer Goods (1IT87); I.T. (1IT96); Land Transportation (1LA43); Transportation Software (1TR97); Automotive Models (1AU61); Passenger Transportation (1PA35); Science & Engineering (1SC33); Robotics & Data Collection Applications (1RO84); Vacuum Cleaners (1VA50); Automobiles (1AU45); Consumer Products & Services (1CO62); I.T. in Transportation (1IT48); Automotive (1AU29); Manufacturing Automation (1MA46))

REGION: (North America (1NO39); Eastern Asia (1EA61); Americas (1AM92); Japan (1JA96); Asia (1AS61); USA (1US73); Michigan (1MI45))

Language: EN

OTHER INDEXING: (AAA; AMERICAN MOTORS; CHEVROLET; CHEVROLET CAMARO; CHEVROLET CAVALIER; CHRYSLER; CHRYSLER CORP; DATSUN; FANUC; FANUC LTD; FORD; FUJITSU FANUC; FUJITSU FANUC LTD; GM; GENERAL MOTORS; GENERAL MOTORS CORP; GMFANUC; GMFANUC ROBOTICS CORP; HENRY FORD; ISUZU MOTORS LTD; NATIONAL AERONAUTICS AND SPACE ADMINISTRATION; PONTIAC; RENAULT; SUZUKI MOTOR CORP; TOYOTA MOTOR CO; TRANSPORTAION; TRANSPORTATION; UA; UNITED AUTO) (Alfred P. Sloan; Arvid Jouppi; Bloomfield Hills; Buick; Buick Skyhawk; Cadillac; Cadillac Cimarron; Cadillacs; Douglas A. Fraser; Douglas Fraser; Drew Lewis; Eric Mittelstadt; Eventually; F.; F. James McDonald; Fairly; Fraser; Frosch; G.M.; G.M. a; G.M. development; G.M. facilities; G.M. itself; G.M. plants; G.M. to; G.M.," Douglas; George Gobel; Gerald Greenwald; Harbour; Hoglund; Illustrations; James E. Harbour; James McDonald; John Holusha; Lawrence E. (Red; Lee A. Iacocca; Lewis; Maryann N. Keller; Mittelstadt; Neverthless; plants; Robert A. Frosch; Robert C. Stempel; Roger B. Smith; Roger Smith; Seiuemon Inaba; Sloan; Smaller; Smith; Stempel; Ten; Tension; Thomas A. Murphy; Tomorrow; Toyota; William E. Hoglund; William Lane) (DATA PROCESSING; COMPANY AND ORGANIZATION PROFILES; AUTOMOBILES)

EDITION: Late City Final Edition

Word Count: 5478
11/14/82 NYT 676
END OF DOCUMENT

Exhibit D

4/30/90 San Jose Mercury News 1D
1990 WLNR 1075559

San Jose Mercury News (CA)

April 30, 1990

Section: Business Monday

GM'S HARD LESSONS

MICHELLE LEVANDER, Mercury News Staff Writer

In 1984, a group of hand-picked **GM managers** came to the NUMMI plant in Fremont to learn the secrets of Japanese auto manufacturing.

For three years, they worked with Toyota **managers** in charge of production at the **GM**-Toyota joint venture, only to return to Detroit daunted by the task ahead.

"It was frightening realizing how tough the competition was and how tough it would be to beat that challenge," said Steve Coletta, now a **manager** at a **GM** plant in Ypsilanti, Mich.

But when the GM scouts returned to their own camp -- flush with the enthusiasm of the newly converted -- they found that Detroit executives weren't prepared for their message.

While New United Motor Manufacturing Inc. has influenced individual GM plants, halfway through this 12-year experiment, GM shows few signs of broadly putting into practice the knowledge it sought from the venture.

Top **GM executives** expected to learn about quick high-technology solutions, not subtle lessons about interrelations on the plant floor that took time -- not money. Adopting those lessons would require profound cultural changes that top GM leadership has been unwilling or unable to make.

Steven Bera, one of the first **GM managers** at NUMMI, remembers the intense interest **GM Chairman** Roger Smith and former **GM President** Jim McDonald showed for the plant.

But, he said, "I think they were very shallow in their insights as to what was actually happening there. You could take them through the plants, and they could see the cosmetics. What they couldn't sense was the feelings and the relationship in the air. Because there isn't a great deal of sentiment in GM."

Quality and production problems have cropped up recently at NUMMI, but many managers and workers say that's because the plant strayed from the basics. Those lessons are simple:

Teach workers and managers to take the initiative, treat hourly workers with respect and show them that their efforts are crucial to the venture's success. Add strict standards to ensure quality, good design and good parts, and the recipe works.

"The secret wasn't really a secret," said George Nano, chairman of the NUMMI local of the United Auto Workers. "I think it was just common sense, allowing workers to think, encouraging them to give their ideas."

Dee Allen, a **GM spokesman** in Detroit, said **GM** may have gone into NUMMI looking for some "magic answers," but that notion was quickly dispelled. Then the company went on to the real work of learning from the venture.

A complacent General Motors was shocked into internal reform in the early 1980s as Japanese competitors began to steadily gain U.S. market share at its expense. The 12-year NUMMI venture, which now employs 2,800, provided a way for GM to learn -- and adopt -- some of the successful management and manufacturing methods of the competition.

Obstacles to change

But GM's plight in the car market and its own internal problems made that task difficult.

(check) In Fremont, Toyota management had the luxury of starting anew. **GM** doesn't, and obstacles came up when **managers** tried to graft pieces of the NUMMI philosophy onto an existing GM culture in other plants.

GM officials now say they don't want to copy the NUMMI model so much as to use it to inspire home-grown solutions.

"NUMMI works because it is a system of many interrelated facets," said Marty Laurent, who **heads** up a special office designed to teach **GM** insiders about the plant. "If I went to NUMMI like it was a grocery store and tried to pick one item (for) my plant, it wouldn't work in the same way."

(check) NUMMI gets results partly because workers build cars that are well-designed to begin with. GM must master basic lessons about design before its plants can catch up with more productive competitors, analysts say. Until GM engineering gets up to par, even the most dedicated workforce can't make a car successful. That NUMMI can outstrip the performance of most GM plants has to do with more than what happens inside its doors, said **GM spokesman** Allen. "It goes deeper into the organization than that. . . . The vehicles **NUMMI** (is) assembling were designed for (ease of) assembly."

(check) **NUMMI** kept its promise not to lay off workers during a two-year slump that began in 1986. GM lacks the same commitment. With a constant threat of layoffs, GM will never get workers fully behind improvement efforts, said **NUMMI President** Kan Higashi. But with **GM's** plummeting market share, analysts question whether the carmaker can afford to make and keep job security promises.

Hopes for **NUMMI** venture

The two automakers went into the joint **venture** with different agendas, but analysts and insiders generally credit Toyota with taking better **advantage** of the experiment.

At **NUMMI**, Toyota set out to prove that it could match its hometown success on American soil with American workers. Its experience gave it the confidence to open plants in Georgetown, Ky., and Cambridge, Ontario.

But Toyota executives were by no means certain at first that they could succeed in Fremont.

Mike Furuhashi, one of the first Toyota labor relations **managers** to come to **NUMMI**, worried about the old **GM** plant's reputation.

"We were told . . . that's the worst plant in the world: high absenteeism, drug abuse, alcoholism. And the UAW Local 1364, the terrible, the worst, most militant UAW in the United States."

But from the beginning, Toyota made it clear that it planned to treat workers with respect and earned their trust in a way GM had failed to do after decades running the old operation.

That NUMMI won over these workers serves as a stark commentary on the problems plaguing American industry,

analysts said.

"There is nothing wrong with American labor, but there is something seriously wrong with American management," said Sheridan M. Tatsuno, president of Neoconcepts Inc. of Fremont and the author of a recent book on Japanese corporate strategy. "We should seriously consider the way we run our plants and manage people."

Broader success eludes GM

GM went into the venture to get a small car with the kind of quality design lacking in its own models. And after humbling market losses, it wanted to learn about Toyota management practices.

GM got its car, a restyled Toyota Corolla it sells as the Geo Prizm, without shelling out the usual $500 million it costs to develop a new vehicle. But the Prizm has yet to became a hot seller, despite favorable reviews, because of poor marketing by Chevrolet, analysts say.

Broader success in the marketplace has also eluded GM, despite internal reform and efforts to adopt some Japanese manufacturing methods. The company's share of the U.S. car market plunged from 46 percent in 1979 to 35 percent a decade later. It remains to be seen whether GM will succeed with its own model for quality car manufacturing, the Saturn plant slated to begin production in June in Spring Hill, Tenn.

At NUMMI, GM set up a program under which groups of a dozen or so managers would spend a few years at NUMMI and then return to the fold to share their knowledge. But many of the managers were dispersed throughout the organization in advisory jobs without the clout to make changes.

GM also tries to convey the NUMMI message by shuffling hundreds of its **managers** and workers through the plant. In response to critics, **GM** has lengthened the amount of time visitors can spend there, but for many, a trip to NUMMI is little more than a cursory look.

American **managers** coming to NUMMI from **GM** faced the most difficult challenge. They had to learn to lead workers rather than control them. "It is something that happened to them, that changed them," said Maryann Keller, an analyst at Furman, Selz and author of a recent book on GM.

John Arle, the top GM official at NUMMI, finds the joint venture's methods for solving problems the most refreshing.

"To have no problems is a problem. Ferret out everything. . . . Traditional American manufacturing people think twice about identifying shortcomings."

Bera, the former **GM manager** at NUMMI, gained insights into the autocratic style at **GM** after a Toyota **manager** chided him for "talking tough" in meetings instead of trying to reach consensus.

Trying to convey such experiences to skeptical GM officials was a frustrating task, especially for the first group of 16 **managers** scattered through the then-735,000-person **GM** organization.

"In some cases, it was almost like we were talking a different language," said Paul Thompson, a **manager** who has since left **GM**.

Some **GM managers** viewed NUMMI as the enemy -- an example waved about to reveal GM's failings, Thompson said. And the enthusiasm of the NUMMI converts only irritated them more.

GM officials said they have improved the way they bring back people from NUMMI, setting up support systems, training and placing them more carefully.

"Because the organization didn't know what to do with NUMMI to begin with, there wasn't a support system," said NUMMI spokeswoman Sharon Sarris. "As plants became more aware, it was easier to place people because the organization was hungrier. It could accept people back in rather than, in some cases, spitting them back out. "

And if NUMMI did nothing else, it made GM officials aware that they needed to think about certain issues more broadly, said Mark Hogan, a former NUMMI general manager who feels he's been able to put NUMMI ideas into practice in his current job.

"Toyota has shown us the capability of our workers has not been tapped," he said.

In the early and mid-1980s, GM was very committed to turning around the company using high-technology fixes, Hogan said. NUMMI taught GM not to look just at technology -- but at how it is integrated with people.

NUMMI also taught GM another lesson about people that will be far more difficult to adopt: a respect for the hourly worker's labor as more than just an expense on the balance sheet.

Unlike many American manufacturers, Toyota sees itself as having a social responsibility to its employees and their families. Even during hard times, the company rarely lays off workers.

NUMMI, helped by the deep pockets of GM and Toyota, carried through on that philosophy. It put people in a training program rather than laying them off during a two-year market slump. The cost: about $5 million.

GM has taken the opposite approach. During its battering in the market in the last decade, its hourly workforce shrank from 468,400 to 300,000. As labor contract talks approach, analysts say GM can't afford to make the same costly job security promises.

But NUMMI President Higashi sees that money as a critical investment in the future. "Once you have people's confidence and trust, the next hard time, you will get much more power from the people."

Workforce

Since 1986, GM has closed 16 plants and idled three others.

Nine new plants have been opened, but thousands of jobs in

the Rust Belt have been eliminated. Hourly workforce has

gone from a peak of 468,000 in 1979 to 300,000 in 1989.

Efficiency

In the '80s, Ford improved overall manufacturing efficiency

by 31 percent and Chrysler by 19 percent. GM improved its

efficiency by only 5 percent during the same period despite

having spend $67 billion on new plants and products in the

1980s.

Profitability

In 1988, GM's per unit profit was $47 in North America.

Ford's profit was $591 per unit and Chrysler was $228.

Source: The Harbour Report.

Photos (2), charts (2)
PHOTO: Judy Griesedieck -- Mercury News
Gabriel Munoz works on the skeleton of the Geo Prizm before it has paint or wheels or other parts
PHOTO: Jose Luis Villegas -- Mercury News
Team leader Jeanette West writes up a defective car with a bad headlight. (color)
CHART: Ron Coddington - Mercury News
Source: Ward's Automotive Reports, Detroit
Shares of U.S. car market. (bar chart)
CHART: Ron Coddington - Mercury News
Source: Detroit Free Press
GM at-a-glance
General Motors, the biggest automaker in the world, has been
hardest hit by the rise of the Japanese car manufacturers.
With headquarters in Detroit, GM employs 765,700 workers and
has total annual sales of $123.6 billion.

Cover Story
Breaking the Mold
Sunday: Halfway through its life cycle, NUMMI struggles to fulfill its promises
Tuesday: From the United Auto Workers, NUMMI's a model some hate, others love
Additional information attached to the end of this article

---- INDEX REFERENCES ---

COMPANY: UNITED AUTO GROUP INC; GENERAL MOTORS CORP; TOYOTA MOTOR CORP; DAIMLERCHRYSLER AG

NEWS SUBJECT: (Joint Ventures (1JO05); Business Management (1BU42); Market Share (1MA91); Sales & Marketing (1MA51); Major Corporations (1MA93); Corporate Groups & Ownership (1XO09))

INDUSTRY: (Land Transportation (1LA43); Automotive Models (1AU61); Manufacturing (1MA74); Passenger Transportation (1PA35); Transportation (1TR48); Automobiles (1AU45); Automotive (1AU29))

REGION: (Americas (1AM92); North America (1NO39); USA (1US73); Michigan (1MI45))

Language: EN

OTHER INDEXING: (CHRYSLER; GENERAL MOTORS; GEO PRIZM; GM; GM TOYOTA; MOTORS; NEOCONCEPTS INC; NUMMI; PRIZM; RUST BELT; SATURN; TOP GM; TOYOTA; UAW; UNITED AUTO; UNITED AUTO WORKERS; UNITED MOTOR MANUFACTURING INC) (Add; Allen; Bera; Broader; Cover StoryBreaking; Dee Allen; Ferret; Ford; George Nano; Higashi; Hogan; Jeanette West; Jim McDonald; John Arle; Kan Higashi; Mark Hogan; Marty Laurent; Maryann Keller; Mike Furuhashi; Paul Thompson; Roger Smith; Sharon Sarris; Sheridan M. Tatsuno; Steve Coletta; Steven Bera; Thompson; Traditional) (JAPAN; US; AUTO;

MANUFACTURING; COMPANY; FREMONT; PLANT; SERIES)

EDITION: Morning Final

Word Count: 2469
4/30/90 SJMERCN 1D
END OF DOCUMENT

Exhibit E

Record: 1

Title:	NUMMI stint helps Hogan think small.
Authors:	Child, Charles
Source:	Automotive News; 04/27/98, Vol. 71 Issue 5763, p8N-X, 1/5p, 1 Black and White Photograph
Document Type:	Article
People:	HOGAN, Mark
Abstract:	Profiles Mark Hogan, head of General Motors company's Small Car Group Operations, while indicating how his employment with the New United Motor Manufacturing Incorporated helped General Motors. Background information on Hogan; Comments from Hogan; How Hogan's career developed.
Full Text Word Count:	435
ISSN:	0005-1551
Accession Number:	580826
Persistent link to this record (Permalink):	http://libaccess.sjlibrary.org/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=580826&loginpage=Login.asp&site=ehost-live
Cut and Paste:	<A href="http://libaccess.sjlibrary.org/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=580826&loginpage=Login.asp&site=ehost-live">NUMMI stint helps Hogan think small.</A>
Database:	Business Source Complete

Section: New American Manufacturers

NUMMI STINT HELPS HOGAN THINK SMALL

The New United Motor Manufacturing Inc. plant in Fremont, Calif., has been good to General Motors - and Mark Hogan.

As a young staffer for Jack Smith, then director of worldwide product planning, Hogan helped plan the joint venture between Toyota Motor Corp. and GM in 1984.

The small-car plant has been extremely valuable to GM. In the early 1980s, GM needed help. Its product quality was lower and its costs were higher than those of Toyota and other Japanese companies.

NUMMI gave GM a window into Toyota's efficient manufacturing techniques, since GM's Chevrolet Prizms are built side-by-side with Toyota Corollas in the plant.

In the past 14 years, NUMMI has become the ``centerpiece" of GM's effort to adopt lean manufacturing, the practice of reducing inventory and other costs to minimal levels, Hogan says.

Toyota and GM reopened a shuttered GM assembly plant with a history of poor labor relations. Many critics said the work force, largely rehired, would never build good cars at the plant.

The doubters were wrong. The plant has consistently posted high quality and low costs for GM.

``The application of our NUMMI experiences is not limited just to North America," Hogan says. ``In fact, NUMMI provided us with the blueprint for our Eisenach plant in Germany and was the basis for our turnaround in Brazil."

Eisenach serves as a model for GM's new plants around the world.

Moreover, NUMMI-trained engineers have spread the message of efficiency throughout GM.

``What's key about these learnings is that they're not finite," Hogan says. ``Each new product design creates a new set of techniques that are dramatically different from the previous set, so our learning is continuous."

Hogan, meanwhile, has climbed the ladder at GM along with his mentor, Smith, who became CEO in 1992 and chairman in 1996.

Hogan headed GM do Brasil for four years before returning to Detroit in 1997 to take command of GM's Small Car Group Operations.

His challenge is huge. While the lessons of NUMMI have helped GM in Eisenach, Brazil and other places, GM still has trouble making money on small cars in America.

Hogan said late last year that productivity at some of GM's small-car plants lags the competition by more than 40 percent.

``Cost reduction is the No. 1 priority, bar none. We need those (small) cars because there is a market for them, but we won't engineer the next generation cars to lose money."

PHOTO (BLACK & WHITE): Hogan: Reducing costs is the priorty.

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By Charles Child
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Exhibit F

9/3/99 San Jose Mercury News 1G
1999 WLNR 1708239

San Jose Mercury News (CA)

September 3, 1999

Section: Drive

NUMMI NOW AND NEXT ANALYSTS PREDICT SPORT-UTILITY OR HYBRID WAGON MIGHT BE FUTURE PRODUCT AT FREMONT PLANT

MATT NAUMAN, Mercury News Auto Editor

WE know this for certain: NUMMI already is building the 2000 model year Toyota Corolla sedans, Toyota Tacoma pickups and Chevrolet Prizm sedans.

Beyond that, it gets a little fuzzy.

General Motors acknowledges that the slow-selling Prizm will go away. That begs the question of what GM will next get out of the Fremont assembly plant it jointly owns with Toyota, if anything.

One scenario, where GM pulls out of **NUMMI** and leaves it all to hungry-for-domestic-production Toyota, now seems unlikely.

"It's not our intention to walk away," Richard Wagoner, **GM president** and **chief** operating **officer**, said last weekend in Monterey. "At the time that it's called for, it's very much the expectation that we'll have a replacement product."

Echoes Brad Rogers, **head** of **GM's** international and joint-**venture** programs: "We're not going away. General Motors puts a high **value** on the **relationship** we've had with Toyota. **NUMMI** is the cornerstone of our **relationship**."

So, then, assuming that GM and Toyota continue the New United Motor Manufacturing Inc. joint-venture, what's next?

It's obvious that GM doesn't need another small car. Currently, the world's largest automaker sells eight small cars in the United States -- Chevrolet Metro, Cavalier, Prizm and Malibu; Saturn S-Series; Pontiac Sunfire and Grand Am; and Oldsmobile Alero. This is at a time when small-car sales are falling. From a high of 115,000 in 1994, Prizm sales fell to under 50,000 last year.

And that's what leads to all the speculation about the future.

In April in the Detroit News, Paul Lienert wrote that Chevy would replace the Prizm with "a less-conventional model" in 2001, "a small crossover vehicle or a sporty coupe that could be built on the Corolla platform." Lienert runs Automotive Intelligence Reports, a Detroit automotive information services company.

In June, he wrote that Toyota was considering building "a smaller tall-roof wagon" at NUMMI. Toyota and GM would each get a version of it, with GM likely selling it as a Pontiac.

Last month, the Kyodo News Service filed a story out of Nagoya, Japan, saying that GM and Toyota were discussing making sport-utility vehicles at NUMMI.

And Automotive News, on Aug. 16, quoted suppliers as saying Chevy would drop the Prizm and build "a sport wagon based on the 2003 Toyota Corolla platform." NUMMI is expected to build that car, the weekly publication said.

For the record, both GM and Toyota are mum.

"Future product? That's up in the air," said Toyota **spokesman** John Hanson.

"I can't officially talk about it," said **GM's** Rogers. "We've considered all those alternatives you just mentioned. Frankly, I think in the end the marketplace is going to dictate it."

Kanji Ishii, NUMMI's president, described speculation of what NUMMI will build next as "a very delicate issue."

Analysts are not so quiet.

"My guess is it'll be some sort of hybrid sport-utility," said Jim Hossack, vice president at AutoPacific, an auto-industry consultancy based in Tustin. "I think we're seeing less emphasis on cars and more emphasis on trucks, particularly on sport-utilities."

A smaller sport-utility would make sense for GM, which now offers the slow-selling Chevy Tracker as its entry-level SUV. It's built at another joint-venture plant, one that GM shares with Suzuki in Ontario, Canada.

In 1998, NUMMI's 4,900 employees built 203,266 cars and 158,406 Tacoma trucks. Of the cars, about one-quarter of them were Prizms; the rest were Corollas. While NUMMI is the sole source for Prizms, Toyota also builds Corollas for U.S. sale in Canada and Japan.

Model year 2000 is the third year of production of the current generation Prizm. With the previous generation (1993-1997), the car was on a five-year production cycle. If that pattern continues, the 2002 Prizm would be the last year of the production cycle, meaning assembly would conclude during the summer of 2002.

For the 2000 model year, changes are few to the NUMMI lineup:

(box) Toyota Corolla. The sedan gets Toyota's VVT-i variable-valve engine technology for 2000, which bumps horsepower from 120 to 125, said Toyota's Hanson. Otherwise, the car gets only minor cosmetic changes.

(box) Chevrolet Prizm. "The vehicle is basically a carry-over," said Margaret Brooks, the Chevrolet brand manager for the Prizm, Metro and Tracker. Some popular features, such as air conditioning and full wheel covers, are now included as standard equipment. The Prizm also gets Toyota's VVT-i engine.

(box) Toyota Tacoma. The truck being built now is the same as the 1999 model, but, Hanson said, "little wrinkles" come midyear. NUMMI executives have said a step-side truck, a pickup with a more stylish cargo box exterior, goes into production in the near future. It'll arrive as a midyear 2000 model. After that, probably in 2001, NUMMI will start building a four-door Tacoma model.

Photos (3)
PHOTO RICK E. MARTIN - MERCURY NEWS\General Motors plans to stop producing the slow-selling Prizm. But, it's uncertain what GM will next get out of the Fremont assembly plant it jointly owns with Toyota, if anything. GM and Toyota officials have remained close-mouthed on the subject.\(990903 DR 1G)\ PHOTO NUMMI builds Chevrolet Prizm sedans, below.\(990903 DR 1G)\ PHOTO Toyota Corolla sedans and Toyota Tacoma pickups, top.\(990903 DR 1G)

RELATED STORIES: Pages 1G and 4G

---- INDEX REFERENCES ---

COMPANY: GENERAL MOTORS CORP; TOYOTA MOTOR CORP

NEWS SUBJECT: (Joint Ventures (1JO05); Major Corporations (1MA93); Corporate Groups & Ownership (1XO09))

INDUSTRY: (Land Transportation (1LA43); Automotive Models (1AU61); Manufacturing (1MA74); Passenger Transportation (1PA35); Transportation (1TR48); Automobiles (1AU45); Automotive (1AU29))

REGION: (Americas (1AM92); Japan (1JA96); North America (1NO39); Asia (1AS61); Far East (1FA27); Eastern Asia (1EA61); USA (1US73); Michigan (1MI45); Washington (1WA44))

Language: EN

OTHER INDEXING: (AUTOMOTIVE NEWS; AUTOPACIFIC; DETROIT; DETROIT NEWS; GENERAL MOTORS; GM; GRAND AM; KYODO NEWS SERVICE; MERCURY; NUMMI; PONTIAC; PONTIAC SUNFIRE; SUV; TOYOTA; UNITED MOTOR MANUFACTURING INC; UTILITY; WAGON) (1G; Chevrolet; Chevrolet Metro; Chevrolet Prizm; Chevy; Chevy Tracker; Corollas; Echoes Brad Rogers; Frankly; Hanson; Jim Hossack; John Hanson; Kanji Ishii; Lienert; Malibu; Margaret Brooks; Metro; Oldsmobile Alero; Pages 1G; Paul Lienert; Prizm; Prizms; Richard Wagoner; RICK E. MARTIN; Rogers; Tacoma; Toyota; Toyota Tacoma; Tracker)

EDITION: Morning Final

Word Count: 1080
9/3/99 SJMERCN 1G
END OF DOCUMENT

Exhibit G

1 of 1 DOCUMENT

Detroit Free Press

August 10, 2001, Friday

GM Executive Gives Toyota Credit for Improving Detroit Firm's Quality

BYLINE: By Jeffrey McCracken

LENGTH: 656 words

TRAVERSE CITY, Mich.--Most credit for General Motors Corp.'s improvement in its product quality and manufacturing prowess after years of trailing competitors goes to Toyota Motor Manufacturing North America, says Gary L. Cowger, GM group vice president of manufacturing and labor relations.

"The roots of our improvement is the Toyota Production System. We learned from them. We've got to give credit where credit is due," Cowger said at the Management Briefing Seminars, an annual gathering of hundreds of auto executives, consultants and others.

GM learned Toyota's manufacturing system, which emphasizes plant-level worker input and eliminating waste, after GM entered into a 50-50 joint venture with Toyota in Fremont, Calif., in 1984. The venture, New United Motor Manufacturing Inc., or NUMMI, makes Corollas and Tacomas for Toyota and the Chevy Prizm for GM. Early next year the sporty Pontiac Vibe station wagon also will be produced there.

Cowger said GM also learned ways to improve or update its manufacturing from an alliance it formed with Suzuki Motor Corp. in Ontario, Canada, called CAMI.

These alliances helped the world's largest automaker shake a long-running disinterest and sometimes even a hostility toward hearing new ideas, he said.

"For many years, individual divisions and business units within General Motors were so big and successful that there was little interest -- and even opposition, in some cases -- to adopting new ideas that came from somewhere else," Cowger said.

GM has created its own worldwide system for better manufacturing, modeled on Toyota's. Cowger said this plan emphasizes safety, quality, productivity and technology at GM's plants in the United States as well as around the world.

Cowger added that GM employees, especially workers on the factory floor and the UAW leadership, supported the new manufacturing system.

"We really have tried to improve our dialogue with the unions. We continue to talk with them so they now understand us and give us their input," he said.

GM's reputation for manufacturing and product quality has been boosted this year by:

The Harbour report, a widely respected study of manufacturing efficiency at North American assembly and stamping plants, this summer showed GM drastically reducing the gap between it and Ford Motor Co. and Chrysler Group. It also gained on Japanese automakers like, of course, Toyota.

A J. D. Power & Associates study of initial quality that rated GM ahead of Ford and Chrysler Group for the first time in many years. GM again closed the quality gap on automakers like Toyota and Honda Motor Co.

-- The recent Consumer Reports magazine rating of new vehicles, which named 11 of GM's 2001 models as recommended buys. A year ago, just four GM vehicles received that rating.

Morgan Stanley auto analyst Steve Girsky said GM seems to have its quality, efficiency and management moving in the right direction.

"I think they are solid all the way around. I especially like them bringing in Bob Lutz, who will help with better products and processes. With him, (CFO) John Devine and (CEO) Rick Wagoner, they've got all the pieces in place. Now it's just a matter of execution," he said.

Cowger also gave the audience a glimpse of GM's product plans. He said the automaker will extend the wheelbase, raise the roof and add a third row of seats to its popular midsize sport-utility vehicles, the GMC Envoy and Chevy Trailblazer, two products rolled out by GM this year.

Those versions of the Envoy and Trailblazer are to be unveiled at an auto show, likely at Detroit's North American International Auto Show in 2002, and should be in dealer showrooms early next year.

 GM, TOYOY, F, DCX, HMC,

LOAD-DATE: August 13, 2001

LANGUAGE: ENGLISH

KR-ACC-NO: DE-GM

JOURNAL-CODE: DE

Exhibit H

4/6/04 Tri-Valley Herald (Pleasanton, CA) (Pg. Unavail. Online)
2004 WLNR 17199968

Tri-Valley Herald (Pleasanton, CA)

April 6, 2004

Section: Business News

GM, Toyota maintaining success

Jennifer Inez Ward, BUSINESS WRITER

W EN New United Motor Manufacturing Inc. began operations at a shuttered General Motors plant 20 years ago, not everyone was sure a Japanese style of producing cars would work on America soil. Today, as NUMMI, a joint operation between Toyota and GM, begins its third decade, the automobile manufacturing plant is considered a trend setter in the auto industry.

"What NUMMI did was open the door for Japanese manufacturers to come to the United States and build production plants," said Erich Merkle, a senior auto analysts with IRN, a research and consulting firm for the automobile industry. "If NUMMI had not been successful, the Japanese might have done things differently in North America."

Today, Toyota has four assembly plants in the U.S. and is building two more.

Since operations began in 1984, NUMMI has produced more than 5 million vehicles. The Fremont-based company has also never had any layoffs.

NUMMI is the only vehicle

assembly plant in California, the 5.3 million-square-foot facility makes the Toyota Corolla, Toyota Tacoma trucks and the Pontiac Vibe for GM.

NUMMI has about 5,700 employees and is represented by the United Auto Workers, Local 2244. Almost 70 percent of NUMMI's work force is made up of minorities.

NUMMI officials said they're happy to celebrate 20 years of existence.

"NUMMI is an important bridge between Toyota and **General Motors**," said Yuki Azuma, **president** and **chief executive officer** of NUMMI. "NUMMI is also the start of Toyota having a manufacturing presence in the United States."

In the early 1980s, Toyota was eager to have operations in America and joined forces with General Motors. GM's Fremont plant on Fremont Boulevard, which had been closed for several years, was a perfect site for the new joint operations.

"Toyota's production system was different from many domestic operations," Azuma said. "Toyota was not sure if its operation system would work in the U.S. market. At the start, the challenge was, 'How can we provide a good atmosphere with team members, especially with the union?'"

Azuma said the company was able to develop strong relations with the union by building trust.

"So far the relationship is very good," he said. "We have open communications here and whatever issues come up the company and the union will work together to try and solve any (problems)."

Numerous calls to both Local 2244 and the UAW national offices in Detroit were not returned.

At its production core, NUMMI uses an operating program similar to Toyota's lean manufacturing and management system. The NUMMI system incorporates worker or team member input. For example, workers can halt the production to call attention to a problem on the assembly line.

"This is very different from (other) domestic manufacturing facilities," Azuma said. "By pulling the cord, team members can address any problem situation before it leaves the plant."

Employee Wanda Howard, whose husband also works at NUMMI, said the company has been a great place to work.

"NUMMI has given us a good life," said Howard, who has worked at NUMMI since its beginnings. "I've got a good job and I'm making good money."

Howard, a quality control inspector at **NUMMI**, was one of the thousands of employees laid off when GM closed the Fremont plant. Howard said **NUMMI** values its employees.

"We're a big family out here," she said. "Management is willing to listen to what team members have to say."

Both Toyota and GM officials said **NUMMI** has been a great success.

"**NUMMI** is very important to Toyota and our operations in North America," said Dennis Cuneo, a senior vice president with Toyota Motor Manufacturing, North America. Cuneo was part of the **NUMMI** startup team. "We learned a lot of **valuable** lessons from our operations at **NUMMI**."

Mark Hogan, **GM** Group **vice president**, said **GM** has gained from its **partnership** with Toyota.

"**NUMMI** has been a great training ground for our executives to learn more about the importance of individual team members in the production process and the benefits of a common production system," he said.

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---- INDEX REFERENCES ---

COMPANY: GENERAL MOTORS CORP; TOYOTA MOTOR CORP

NEWS SUBJECT: (Plant Closings (1PL71); Economics & Trade (1EC26))

INDUSTRY: (Transportation (1TR48); Land Transportation (1LA43); Automobiles (1AU45); Automotive (1AU29); Automotive Models (1AU61); Manufacturing (1MA74); Passenger Transportation (1PA35))

REGION: (USA (1US73); Americas (1AM92); North America (1NO39))

Language: EN

OTHER INDEXING: (FREMONT; GENERAL MOTORS; GM; GM GROUP; IRN; NUMMI; PONTIAC VIBE; TOYOTA; TOYOTA COROLLA TOYOTA TACOMA; TOYOTA MOTOR MANUFACTURING; UAW; UNITED AUTO; UNITED MOTOR MANUFACTURING INC) (Azuma; Cuneo; Dennis Cuneo; Erich Merkle;

Howard; Jennifer Inez Ward; Mark Hogan; Numerous; Wanda Howard; Yuki Azuma)

Word Count: 820
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Exhibit I

Learning Through Alliances:
GENERAL MOTORS AND NUMMI

Andrew C. Inkpen

In recent years, companies have often touted the learning opportunities created by their strategic alliances. Alliances, the argument goes, bring together firms with complementary skills. Alliances can provide a window into the skills and knowledge of other firms and create a powerful tool for learning. By working closely together, partner firms can gain access to the best practices of their partners and then transfer the practices back to the parent organization.[1] In an interview a few years ago, BP CEO John Browne discussed the value of learning through alliances and stated, "Any organization that thinks it does everything the best and need not learn from others is incredibly arrogant and foolish."[2]

There is no question that many firms enter alliances with learning objectives. In reality, however, learning through alliances is very difficult. Although alliances often create valuable learning opportunities, the exploitation of the opportunities is a difficult, frustrating, and often misunderstood process.[3] More often than not, firms learn little from their alliance partners. There are various reasons why learning does not occur: the partner's knowledge is not properly understood; the intended recipient rejects the knowledge; the transfer mechanisms are inappropriate for the type and scope of knowledge; or insufficient resources are applied to the learning task.

Nevertheless, some alliances do yield valuable learning. General Motors (GM), the world's largest automaker and a firm often criticized as staid and wedded to old ideas and practices, has exploited the learning opportunity created by NUMMI, its California-based alliance with Toyota. Over the past few decades, GM has steadily and significantly improved its quality and productivity. A key factor in this improvement has been knowledge transferred from Toyota to NUMMI and NUMMI to GM. Senior executives at GM acknowledge that NUMMI has been at the forefront of the firm's efforts to adopt lean manufac-

turing. According to Gary Cowger, GM VP manufacturing and labor relations, "The roots of our improvement are in the Toyota Production System [TPS]. We learned from them [Toyota]. We've got to give credit where credit is due."[4] An executive, interviewed for this study, referred to NUMMI as the "guiding light for the improvement in GM manufacturing quality." Another senior executive, Mark Hogan, said, "NUMMI has become the centerpiece of GM's efforts to adopt lean manufacturing, the practice of reducing inventory and other costs to minimal levels."[5]

In exploiting the NUMMI learning opportunity, the GM experience shows that not only is it possible to learn from an alliance, the learning can be the basis for major skill upgrading. In this article I describe how GM transferred the "sticky" knowledge[6] of NUMMI to the initially skeptical GM manufacturing community. To develop the article, I interviewed more than 45 current or former GM managers and visited NUMMI and various other GM plants. For a detailed discussion of the research methods, see the Appendix.

With NUMMI, GM was faced with a complex alliance learning situation. For successful learning to occur, GM had to develop a new way of manufacturing that involved a complex set of organizational factors. The knowledge obtained from NUMMI spiraled its way through the GM organization and supported development of world-class manufacturing facilities in various locations, including Eisenach, Germany; Rosario, Argentina; and Lansing, Michigan. The knowledge also allowed GM to develop new insights into Toyota's strategy, organization, and operating systems, something that would have been much more difficult without NUMMI. Over time, GM put a variety of learning mechanisms in place and a systematic approach to alliance learning and knowledge transfer emerged. These mechanisms include managerial assignments to NUMMI, visits and tours to NUMMI, a technical liaison office for managing learning activities, leadership commitment and involvement in the learning process, and a learning network to articulate and spread the knowledge.

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Background

Why are so many firms are unable to exploit alliance learning opportunities? Gaining access to partner knowledge is not usually the problem for alliance partners. The primary obstacle is a failure to create the specific organizational processes necessary to acquire, assimilate, and disseminate alliance knowledge. In other words, organizations do not know how to create a successful alliance learning environment and overcome knowledge transfer barriers. More specifically, most alliance learning experiences are characterized by one or more of the following problems.

- ***Causal Ambiguity***—Firms often fail to understand or appreciate their partner's areas of competency, a situation that has been referred to as causal ambiguity.[7] Causal ambiguity arises when managers do not

understand the relationship between organizational actions and outcomes. A common expectation in the alliance context is that the knowledge associated with differences in skills between the partners will be visible and easily transferable. Many firms have expected to find knowledge in their alliances that could be easily transferred on a piecemeal basis. Often these firms formed their alliances with an objective of learning *what* their partner knew, rather than *how* and *why* the partner firms knew what they knew. Once they learned more about their partners, they realized that the most valuable knowledge was deeply embedded in an overall philosophy of doing business and tied to the culture and values of the partner firm. Once a firm realizes that alliance knowledge is more complex than expected, there is a tendency to conclude that the learning effort is simply too difficult and not worth a major investment in knowledge management.

- ***Leadership Commitment***—Top management's role in organizational learning should be one of catalyst and architect. While multiple advocates are important, there must be at least one strong champion of learning in a leadership position. The leader's role is especially important in initiating linkages between parent and alliance strategies. Unfortunately, managers and leaders without direct involvement in the alliance management or its operation often do not appreciate the deeper meaning of the differences in skills between the alliance and the parent and, hence, discount the learning opportunity. More than a decade ago, Hamel and colleagues identified a problem that still exists in alliances: leaders are often obsessed with alliance ownership and structural issues while discounting the alliance learning opportunities.[8]
- ***The Cost of Learning***—To learn through alliances it is not sufficient to merely expose individuals to new knowledge; the intensity of efforts applied to the learning is also critical. Unfortunately, many companies are unwilling to incur the expense of setting up learning-oriented systems, such as sending key parent managers to the alliance on a regular basis to experience the alliance first-hand. In one case, the Japanese partner sent dozens of engineers to the joint venture for short-term assignments with no clearly defined tasks, leaving the American partner wondering how the Japanese partner could afford it. From the Japanese partner's perspective, the value of the learning more than compensated for the cost of the engineers. Given the sometimes haphazard and idiosyncratic nature of alliance learning, firms may view resources committed to learning as extravagant, wasteful, and not directly associated with successful alliance management. However, you get what you pay for and if no investment in learning is made, learning will not occur.
- ***Individual Managers as the Learning Conduit***—Learning through alliances starts with the individual managers who have direct exposure to the alliance operation. These managers are often assigned to the alliance for a specified period of time after which they will return to the parent

organization. Although these managers are expected to be knowledge brokers, all too often they are rotated back to the parent and their unique insights fall on deaf ears.[9] The problem is that these managers are expected to share knowledge but are often inadequately prepared for their re-entry to the parent. The recipient units often do not know how to take advantage of the rotated managers. The result is that learning dissipates as individuals find themselves unable to influence organizational change in the parent. Quite often these managers become frustrated and leave the organization, perhaps to join a competitor or even the alliance partner.

- ***Not Invented Here Syndrome***—Finally, the classic problem of the Not Invented Here Syndrome can derail an alliance learning experience. Parent company managers are often threatened by the learning occurring in their alliances and by the managers assigned to work in the alliance. The result is that parent managers often discount the value of the learning potential and make statements such as "What they do in the alliance does not apply here. The alliance is in a different business." The parents may have difficulty accepting the alliance child, a new organization with limited experience, as a legitimate teacher. Rover, a failing U.K. car company, formed its first alliance with Honda in 1980. Although Rover came to rely heavily on Honda for technological support, the company had no strategy for learning until 1991, which by then was too late. The entrenched culture in Rover ultimately meant that a valuable learning opportunity was squandered.

NUMMI and General Motors

Negotiation and Formation of the Alliance

In 1982, GM and Toyota began negotiating a 50:50 equity joint venture to assemble small cars in the United States. After a year of negotiations (led by Jack Smith, GM's chairman from 1996-2003), the two companies announced a partnership based at GM's plant in Fremont, California, which GM had closed in 1982 after being plagued for years by labor and quality problems. Toyota contributed $100 million and GM provided the plant (valued at $89 million) and $11 million cash. The companies also raised $350 million to build a metal stamping plant. For Toyota, the main alliance objective was rapid U.S. market entry to counter Honda and Nissan and to alleviate trade friction between Japan and the United States. Toyota was also interested in learning to work with an American workforce. The primary goals for GM were sourcing a small car and utilizing an idle plant. Learning from Toyota was a goal of GM's Chairman Roger Smith but was not clearly formulated or widely shared within the GM manufacturing organization.[10]

NUMMI began operating in 1984. Toyota was given overall operating responsibility for the plant and product design. The first CEO was Tatsuro Toyoda, son of the founder of Toyota. The chief operating officer also came from

Toyota and the general manager from GM. The joint venture agreement allows GM to assign up to 16 managers to NUMMI (the actual number has sometimes been higher). These managers work in various different areas, including human resources, finance and accounting, engineering, and purchasing. A number of managers also have been hired from outside GM and Toyota. One of the most important early decisions by GM and Toyota was to seek a different union agreement with the United Auto Workers. The union agreed to the adoption of the Toyota production system with its flexible work rules and broad job classifications.

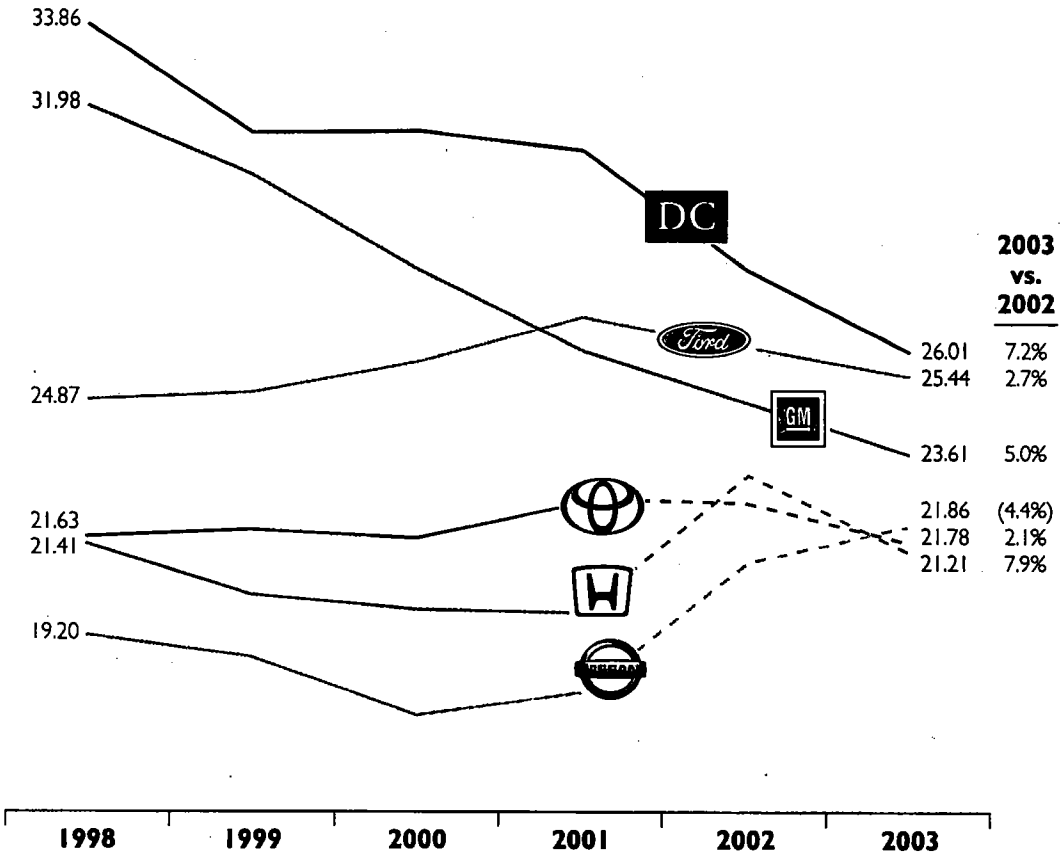
GM has been able to use NUMMI as a source of knowledge in the assembly area and there has been a real and effective knowledge transfer. That said, GM was very slow to capitalize on the learning opportunity. NUMMI has provided GM with important insights into Toyota's competitive strengths but because activities such as product development and engineering are outside the scope of NUMMI, GM's learning opportunities have been primarily in the manufacturing and assembly area.

In 2004, the NUMMI plant continued to be an important source of small cars for both parents. In 2003, NUMMI built 395,000 vehicles, the most in its history. Employment in the plant in 2004 was at its highest level ever (about 5700) and three vehicles were being manufactured: two cars—Toyota Corolla and Pontiac Vibe and the Toyota Tacoma pickup truck. Plant operations include plastics, stamping, body and weld, paint, and assembly.

The Learning Impact

Over the past few years, GM has significantly improved its quality and productivity. In 2002, GM surpassed Ford for the first time in the 13-year history of the influential Harbour Report's annual study of North American auto-plant productivity. In 2002, GM became the first American carmaker to rank in the top three of the J.D. Power and Associates' annual Initial Quality Study, which measures customer complaints in the first 90 days of ownership. Exhibit 1 shows GM's improvement in labor productivity over the past five years in comparison to its major competitors. GM also narrowed the gap between its quality ranking and that of Honda and Toyota, the perennial North America quality leaders. In the J.D. Power report, GM had the top three positions for North American plant quality and the top ranked plant in South America. GM executives have publicly identified one of the factors in their own improvement as learning from NUMMI. According to one executive, "NUMMI has become the centerpiece of GM's efforts to adopt lean manufacturing, the practice of reducing inventory and other costs to minimal levels." Learning from NUMMI has had an impact on GM. However, that learning did not occur easily or quickly. Many GM executives were initially skeptical of the learning opportunity and it took almost a decade before a real learning system began to emerge.

EXHIBIT 1. GM Assembly Labor Productivity—Hours per Vehicle



Source: Data from Harbour Consulting; GM excludes medium duty vehicles; Honda, Nissan, and Toyota 2002 data includes Harbour.

The Learning Trigger for GM

As soon as the joint venture began operating, NUMMI's productivity relative to other GM plants produced comparative data that demonstrated the significant differences between GM and Toyota.[11] GM produced various internal studies designed to identify the reasons for NUMMI's superior productivity and educate the company's leadership. One GM study done in 1985 found that "the result of the Toyota approach is products of superior quality produced with significantly fewer human resources (40%) and lower investment (30% to 50%) than at comparable GM facilities." The initial managers (i.e., the advisors) assigned to NUMMI quickly realized that the Toyota Production System (TPS) was different and potentially valuable for GM, which meant that NUMMI assignments developed into unique personal learning experiences. A GM manager who worked at NUMMI in the 1980s described the experience as "a feeling of zealotry. What we were seeing was so much better, so much easier, and so

much more effective than in GM. We thought that surely GM would see the light. We knew that NUMMI could have a profound effect on GM."

GM's Initial Struggles With Learning

GM's attempt to transfer knowledge in the mid-1980s was driven by the realization that NUMMI was outperforming comparable GM plants. However, the first few waves of advisors moved from NUMMI to GM were largely unsuccessful in their efforts to transfer knowledge. One problem was that managers assigned to NUMMI in the early years of the joint venture were given little preparation or training for their assignment. One manager sent to NUMMI in 1986 had one month to prepare and was told by his boss in Detroit to "learn as much as you can." When these managers' assignments were completed, normally after two years, they were expected to return to GM to share their experience. However, although the NUMMI advisors were learning as individuals, many became frustrated when they re-entered GM because they were unable to implement the ideas they had learned from NUMMI. This difficulty with implementation was driven by two factors. The first was significant resistance within GM and a lack of understanding as to how GM could benefit from lean manufacturing. Although some GM executives saw an opportunity to learn from Toyota, many senior managers were opposed and even resented the idea of collaborating with a Japanese company. These managers were essentially in denial, attributing the Japanese automakers success to unfair competition (low value of the yen, government support in Japan, and so on) rather than better management. Under these circumstances, which persisted until about 1992, system-wide learning was impossible.

The lack of understanding and appreciation for the value of NUMMI knowledge ties back to the discussion of causal ambiguity. Knowledge cannot be appropriately valued if it cannot be understood. Knowledge associated with the TPS was particularly difficult to understand because of its systemic and integrated nature, which leads to a second factor impacting the implementation of NUMMI ideas. Within GM there was a belief that the "secret" to the TPS was observable and transportable, i.e., "if we could just get the blueprints for stamping." However, the knowledge was not easily broken down into transportable pieces. The knowledge about the TPS and lean manufacturing was deeply embedded in the Toyota context and was tied into an integrated system.[12] As a manager said, "You cannot cherry pick elements of lean manufacturing; you must focus on the whole system. Once you learn how the system works you need a good understanding of the philosophy that underpins it." The initial learning challenges are summed up in the following statement from a GM manager:

> "We [managers in GM] started with denial that there was anything to learn. Then we said Toyota is different, so it won't work at GM. Eventually we realized there was something to learn. The leaders initially said: implement lean manufacturing, but they did not understand it. . . We went to Japan and saw *kanban* and *andon* but people did not understand why they work. We did not understand that the

> TPS is an integrated approach and not just a random collection of ideas. . . We implemented parts of the system but did not understand that it was the system that made the difference. . . We did not understand that the culture and behavior had to change before the techniques would have an impact."

By the mid- to late-1980s pockets of support for using NUMMI as a learning vehicle were emerging within GM. However, the North American manufacturing organization was largely opposed to a joint venture with Toyota and was confident in its own abilities. Many advisors who were moved to such an environment found that they had limited influence on the beliefs and norms of the new GM unit to which they were assigned. Those that were able to make an impact had to persevere and accept that in the early days of learning from NUMMI, implementation of lean ideas would mean limited recognition and rewards.

There were other learning missteps. From 1990 to 1995 GM did extensive videotaping of NUMMI operations with the expectation that the videotapes could be used to illustrate the TPS. The problem was that the videotapes could only show how the TPS worked and not why, which meant only surface learning could happen. GM also tried to quickly implement some of the obvious TPS elements, such as *andon* systems. An *andon* refers to the warning lights on an assembly line that signal work center status. In the *andon* system the operator can signal the team leader when there is a problem. The worker pulls the cord once to sound an alarm to get the team leader's attention. If the cord is not pulled again within 60 seconds, the line will stop. For GM, the idea of allowing line workers to stop the line was revolutionary. In trying to implement *andon*, GM initially failed because they did not understand the non-visible processes that supported *andon*, such as standardized work, team member systems, and problem solving.[13] As one former plant manager said, "I was not successful in implementing *andon* because we did not really understand what it would take to make it work." Whereas GM interpreted the *andon* system as "when you pull the cord the line will stop," Toyota developed *andon* so the operator could get help when needed and to ensure the line kept moving at the optimal speed and to ensure that problems were solved when they occurred. Only rarely will the entire assembly line stop at Toyota, whereas GM initially saw *andon* as problematic because it could lead to line stoppages, which in the mass production mentality is the worst thing that can happen. Ironically, GM initially focused on TPS elements associated with visual control (such as *andon*) because the elements were visible and obvious to anyone seeing the TPS for the first time. However, the key lessons of the visual control elements were not visible and required deep understanding of the TPS.

A Learning System Emerges

In 1992, a pivotal event occurred. Jack Smith was appointed as CEO and played a key role in changing the leadership orientation towards NUMMI. Jack Smith headed the GM negotiating team when NUMMI was formed and understood that the joint venture created a major learning opportunity. Smith became

the head of European operations in 1987, vice chairman for international operations in 1990, CEO of GM in 1992, and chairman in 1996. In Europe, Smith built a team of colleagues that recruited people who understood lean production, many of whom who had experience in NUMMI (see sidebar on NUMMI and Greenfield Plants). With Jack Smith as CEO, learning from NUMMI became a priority for GM (although vestiges of the denial lingered on for years). The following describes the key mechanisms that supported learning and knowledge transfer.

The Technical Liaison Office

In 1985, GM created the NUMMI Technical Liaison Office (TLO) in Fremont. The TLO's task is to manage and document learning and disseminate knowledge from NUMMI to GM. From 1985 to 2003, the scope of the TLO expanded to incorporate a wide variety of training and knowledge transfer activities. More specifically, after 1992, significant changes were made in how the TLO supported learning. The TLO is staffed by a small number of full-time employees and, like NUMMI itself, has a group of 10-11 advisors on assignment from GM. These advisors have the same structured learning requirement as the advisors in NUMMI, although TLO advisors spent more time on teaching activities than advisors assigned to the plant.

The TLO is involved in both knowledge transfer from NUMMI to GM and knowledge change within GM. The TLO coordinates the multi-year advisor programs and other shorter visits, including the following:

- study teams focused on learning about a specific task (such as how to build doors), the TLO designs a learning experience of 3 days to 2 weeks, and teams must establish an implementation team and follow-up;
- short awareness visits and plant tours (1-2 days);
- short-term assignments (2 weeks);
- executive in residence (8 months), one executive at a time; and
- topical workshops (3-5 days) on topics such as recognition and rewards, which may be broadcast to other GM sites.

The TLO supports the documentation of TPS knowledge, which makes the knowledge more easily teachable and transferable. The TLO also performs training designed to educate GM managers about the potential impact the TPS could have on GM manufacturing. Finally, in recent years the TLO has expanded its activity base to include a consulting business primarily focused on NUMMI and GM suppliers.

Enhancements to the Advisor System

The creation of the TLO provided the foundation to enhance the selection, training, and deploying of advisors. With the appointment of a new TLO head in 1990, various changes were made to the advisor system to ensure that the advisors maximized their personal learning opportunity and to ensure that advisors were well armed for the knowledge transfer challenge they would face

NUMMI and Greenfield Plants

NUMMI played a key role in the development of the Opel plant in Eisenach Germany. The Eisenach plant, which opened in 1992, was the first greenfield GM plant to institute TPS-based lean manufacturing. Some NUMMI alumni were involved in the startup. When Eisenach was conceived by GM Europe management, the objective was "to build a plant like NUMMI." Although many people in GM, especially in North America, said it could not be done, Eisenach was an outstanding success. Eisenach was also the most tangible initial evidence that GM was capable of implementing lean manufacturing. Eisenach became the model for a series of greenfield plants in Argentina (opened in 1997), China (1998), Poland (1998), and Thailand (2000). NUMMI also was the basis for a major turnaround effort in GM do Brasil, which preceded the Argentina plant development. As each international greenfield plant was built, lean production knowledge levels increased and the network of knowledge expanded. With each greenfield plant, the objective was greater manufacturing efficiency than the previous one.

A new core of lean manufacturing experts was created with each greenfield initiative, which increased the learning network. For example, the first plant manager in Argentina came from Eisenach where he had been operations manager for five years including during the startup. While Argentina was being developed in the mid-1990s, the plant manager was making 4-5 visits to NUMMI per year with a team of people. At another Latin American plant trying to become leaner, all the managers (7 employees), supervisors (20), and team leaders (35) visited NUMMI. A large number of Brazil managers were temporarily assigned to Argentina, many of whom had been to NUMMI and were familiar with lean manufacturing concepts. Most of the original team of managers involved in the Eisenach startup are still with GM and have played a key role in sharing lean manufacturing knowledge.

Within North America in the late 1990s, lean production began to influence all aspects of manufacturing. The most visible outcome of the lean manufacturing knowledge transfer in the United States in a greenfield plant is the Lansing Grand River plant opened in early 2002. The Lansing Grand River plant was built on the site of 19 demolished buildings that dated to Oldsmobile's earliest days at the turn of the last century. The plant cost $559 million, about half what GM spent in the past on similarly sized plants and at 644,000 square feet, the plant is about half the size of a traditional assembly building. Lansing Grand River embodies many of the TPS-derived lean manufacturing ideas and builds on GM's experience with the international greenfield plants. The plant is a testament to GM's success at learning from NUMMI as well as the company's ability to innovate. A Technical Liaison Office at Lansing Grand River has been created to replicate the NUMMI TLO concept in a wholly owned GM facility.

From a broad base of learning that began with NUMMI and includes Eisenach and the other international greenfield plants, the CAMI joint venture with Suzuki, the relationship with Isuzu, and various other learning opportunities, GM has created its Global Manufacturing System (GMS), which is GM's lean manufacturing system being implemented on a worldwide basis. Plans are underway to use the TLO concept to create GMS learning centers in Asia, Europe, and Latin America.

once they moved on from NUMMI. The changes were the result of trial-and-error and direct feedback from the experience of the earliest advisors. Unlike the early days of NUMMI when advisors were given little or no preparation for their assignment, the advisors selected today have clearly specified learning objectives and an educational plan. The main elements of the plans in 2003 were:

- Each advisor's learning experience is customized and is supported by a learning contract and a mentor in GM. This process is managed by the head of the TLO and requires regular follow-up with the mentor.
- A structured learning experience is created, with the learning centered around five elements: plant line assignments, learning from predecessor advisors, learning across different areas of the plant, networking with other NUMMI alumni, and learning to become teachers.
- Individual advisor learning is tailored and supervised using Personal Development Requirements (PDRs) tied to the advisors' expected re-entry assignment. The PDR is an educational tool that organizes learning activities in various stages: orientation to NUMMI and lean manufacturing; plant floor work; required training in areas such as standardized work, Japanese culture, and teaching; required reading of about 20 books on lean manufacturing, change management, and general management that must be read in sequence; individual learning (called "Take Time to Learn"); visits to other lean U.S. and international plants; and home unit visits. All training is coordinated through the TLO.
- Advisors are prepared in advance for their re-entry assignment in GM. In almost all cases, advisors have a clear expectation of the managerial position they will occupy once they return to GM. What this means is that advisors can focus on specific areas that will help them in their return assignment. (See the sidebar on the Orion Assembly Plant for an example of how one ex-NUMMI manager was able to affect change in a GM brownfield plant.)
- All advisors are required to write summaries of their learning experiences and implications for GM. These summaries, called White Papers, are then disseminated within GM.
- Senior executives from GM regularly visit NUMMI, which reinforces the importance of the advisor learning experience. The result of the systematic learning can be seen in the reaction from the outside labor market. By the late 1990s, managers trained at NUMMI became so attractive to outside employers that GM was forced to introduce financial penalties for managers who left GM within two years of their NUMMI assignment.

Changes to GM's Knowledge Base

The creation of the TLO and the changes to the advisor system were critical in ensuring that knowledge was identified, captured, and put into motion. However, the knowledge from NUMMI could not impact GM until it was combined with existing GM knowledge. For this to happen, GM managers would

have to acknowledge that the knowledge had value. However, many GM leaders in the late-1980s did not yet have deep understanding of why the knowledge was valuable and how it could be utilized by GM. In the absence of leadership understanding, knowledge transfer cannot have a strategic impact. As GM gained experienced with NUMMI, GM leadership came to the realization that TPS-based knowledge was valuable. Several factors played a key role in helping shift the perception about how NUMMI could influence GM. These factors collectively supported changes to the GM knowledge base.

- *Visits and Plant Tours*—Initially, Toyota limited the number of visitors in NUMMI to five, not because of concerns about knowledge leakage but because of concerns that the plant's production would be disrupted. After this restriction was ended, the number of visitors increased significantly. Between 1984 and 1988 there were about 2,000 visitors. Between 1989 and 2003 there were about 21,000 visitors, including non-GM individuals and companies. Visits and tours were instrumental in exposing many, often skeptical, GM managers, engineers, plant workers, and union officials to the fundamentals of the TPS. While these visits do not allow visitors who are unfamiliar with the TPS to develop a real understanding of its systemic nature, the visits can generate new insights and awareness that would not be possible without firsthand exposure to the plant. It should also be emphasized that in the early years of NUMMI (1984-1990), the short visits had limited impact because there were few GM teachers who could explain the TPS. These visits did nothing to change the minds of head-in-the-sand GM managers who didn't want to learn. As the base of knowledge about the TPS expanded within the TLO, it was possible to provide a stronger learning experience for visitors.
- *Leadership Commitment and Involvement*—When NUMMI was first created, there was limited understanding about Japanese management practices in the U.S. auto industry and in U.S. industry in general. The measurable differences in Japanese automaker productivity and quality were known but the principles of lean manufacturing were only vaguely understood (and the term itself did not emerge until later). GM leadership in the early 1980s tended to downplay the Japanese competitive threat. However, as increasing numbers of managers and executives were exposed to NUMMI, GM leadership re-evaluated the learning opportunity. In addition, new leadership at GM recognized the competitive strength of the Japanese firms. The result was a more pragmatic approach to learning from Toyota. By the early 1990s, knowledge about TPS was being actively sought by automakers all over the world. GM's joint venture with Toyota provided an important advantage in knowledge access relative to its competitors. More importantly, many NUMMI alumni have moved on to senior positions and the ability to directly influence GM's manufacturing systems.
- *Learning Network*—About 240 advisors have been through NUMMI and as of 2003 about 170 were still working in GM in a variety of management

Change in a Brownfield Plant: The Orion Assembly Plant

In 1983, GM opened its Orion assembly plant in Orion Township on the I75 corridor in south Michigan. At the opening, the plant was described by GM as "the last word in automation, sophisticated manufacturing systems, and enlightened labor relations." By the late 1990s, Orion was one of GM's poorest performing plants with a myriad of problems: major labor unrest, chronic absenteeism, thousands of employee grievances, substandard quality, a local union agreement that was expensive and restrictive, occasional sabotage in the plant, and temporary plant shutdowns because of friction between the workers and the company. Labor and management relations were so bad that some hourly employees refused to even acknowledge salaried employees unless they were directly addressed.

In January 2001, Jamie Hresko became plant manager at Orion. Hresko, a native of Flint, Michigan, started with GM in a co-op program after high school. After finishing an engineering degree, he worked in a series of manufacturing positions, including a stint at the Orion plant. In 1997, Hresko was sponsored for an MBA at Stanford and when he finished, was asked to go to NUMMI. Initially, Hresko was not impressed with what he saw in the NUMMI plant. From his perspective, there did not appear to be a clear process being followed. To learn more, he got a job on the line and ended up staying there three months. He took the team leader course, was promoted to team leader, and had firsthand insight into how the TPS worked. "I was shocked to learn that the hourly people essentially ran the place. The success of NUMMI was largely due to the small team system." Like many other managers who experienced the TPS firsthand, Hresko's views about how to run a car plant were transformed.

In 1999, Hresko became an assistant plant manager at Lansing and was successful in implementing a team system modeled on the NUMMI approach. Hresko's success at Lansing resulted in his promotion to plant manager at Orion. When Hresko arrived at Orion in 2001, the implementation of GM's Global Manufacturing System (GMS) had already begun. Based on GM audits, the GMS implementation at the Orion plant was about 50% in 2001. However, many of the problems identified earlier still existed. For example, there were almost 1300 employee grievances in 2001 and the union relationship was terrible.

In addition to the establishment of small teams (1-7 ratio), the priority issues for implementation at Orion included *andon*, error proofing, the institutionalization of problem-solving training, and GMS training for all salaried employees. At first, the hourly employees were skeptical about the team system. As one employee who had worked in the plant since it opened said, "We laughed. We had heard it all before, starting in 1983. We figured it would last a few weeks and then disappear."

Hresko was determined to make Orion a lean operation and was passionate about building trust between management and the hourly employees. To implement the changes and get the hourly people more involved in running the plant, Hresko knew that he would have to eliminate all vestiges of GM's heritage of conflict and union-management strife. Hresko had the support of his boss and his direct reports in the plant. Lean manufacturing based on GM's Global Manufacturing System was being implemented throughout North America and results were starting to show up in various quality and productivity rankings. Nevertheless, the barriers to change at Orion were significant. The team concept requires team leaders, which means

some hourly employees have to take on greater responsibilities. Initially, few employees wanted to be team leaders because that was seen as "sucking up to management and they were the enemy." To some salaried employees the team concept meant giving up control to hourly workers who, it was assumed, were not qualified to make decisions. The team concept also requires the managers to work with the hourly employees more as partners and less as subordinates. The union leadership saw the team concept as a way to reduce employment and did not understand that in the increasingly competitive automotive environment, lean meant survival. To the skilled trades workers, such as those in maintenance, the team concept looked threatening because it meant teams would have greater responsibility for their own worksites. It also probably looked like just another attempt by GM to benefit the corporation at workers' expense. Finally, perhaps the biggest barrier to change was the history in the plant and the lack of trust between management and hourly workers.

To implement change, Hresko and his managers focused on communication and training. Although some people were resistant to any changes, the main emphasis of the implementation program was working with people to convince them that GM had to become leaner in order to compete. "The only way we could improve performance was if management and the union worked together. Eventually the union came to understand the realities of the competitive environment, something that could never have happened in the past." A new plant union leader was elected and he has proved to be instrumental in enabling the implementation of lean ideas. There were some mangers that could not work in the new environment and had to be let go. New training programs were launched, including an outdoor team-building exercise called Buzzard Ridge on the plant property.

Over the next three years the plant went through remarkable change. Significant improvements occurred in safety, the number of grievances (less than 50 in 2003), participation in the suggestion program (from 55% participation to 85% participation), GM audit problems per vehicle and JD Power problems per vehicle, warranty incidents per vehicle, and hours per vehicle. The 2003 JD Power North American plant ranking based on customer reported problems ranked Orion number 6 out of North American plants (#21 in 2002). According to Hresko, "The healing stage is over and the plant is now one of the best plants in GM." As evidence of the improvements, the Orion plant was chosen to build the new Pontiac G6, which was launched in 2004. To convert the plant body shop for the new product, Hresko decided to take a significant risk and rely much more on his own employees and less on outside contractors. At first, his bosses were leery: their view was that hourly people did not have the skills. Hresko persisted with the plan and was able to save the company millions of dollars. He also built a base of knowledge and was able to involve the skilled trades employees to a high level.

> positions. There is unanimous agreement among the advisors that their personal NUMMI experience was a pivotal point in their careers. Shorter-term visitors to NUMMI also indicated that their experiences were extremely valuable. Linking the various personal experiences of the advisors and all GM employees who have had contact with NUMMI is a constantly growing network of employees who have a range of understanding about the TPS. This network continues to play a key role in

spreading knowledge and ensuring that the recipient units understood why NUMMI is used as a model for GM. Until the network had sufficient critical mass, changing the traditional knowledge base at GM was bound to be difficult. According to a former head of the TLO:

> "There was definitely not a critical mass by 1990. In my view, a critical mass was reached when Jack Smith became CEO [in 1992]. Jack Smith promoted people with NUMMI experience and made it clear that he was a supporter of lean manufacturing. With the previous top management, it was not a great thing to have on your resume that you had worked at NUMMI."

Social network researchers use the term "network effects" to describe the process whereby individuals in a social network converge in their views and behaviors to the extent that they have exposure to other people in the network.[14] As more and more GM managers became exposed to NUMMI and as some of these managers eventually moved to senior manager positions, the initially disorganized pattern of learning from NUMMI began to shift to a more systematic approach as the NUMMI "followers" (i.e., those that had been exposed to NUMMI and believed in the learning opportunity) interacted and shared their views. For example, consider the comment from a manager who was at NUMMI in the mid-1980s:

> "We were making inroads but it took time to convince the leadership. In 1990, four of us from NUMMI got the leadership to agree to let us use the concepts in teaching. We designed a workshop where we focused on waste and integrated into it concepts of TPS. We got plant leaders to teach and we facilitated. The workshops snowballed and took off; we realized that we had to grow the knowledge."

The network of former NUMMI advisors is managed informally rather than formally. The head of the TLO keeps in touch with NUMMI alumni and actively follows their career progress. Also, given that securing a NUMMI advisor position is now quite competitive within GM and TPS knowledge is willingly embraced, the NUMMI alumni network now occupies a more visible role in the firm.

Facilitating Factors and the Learning Process

There are several factors that facilitated effective learning and knowledge transfer at GM.[15] First, the company's initial learning objectives had to be significantly modified before effective learning could occur. The firm's willingness to adjust the learning objectives over the life of the alliance was an important ingredient in ensuring that the learning process focused on the most valuable knowledge. GM's initial efforts at learning were narrowly applied and, as noted, there was a belief that TPS knowledge was observable and easily transportable. Also, there was an expectation that the learning would happen quite rapidly. Over time, as the magnitude and complexity of the learning opportunity became clearer, GM instituted the various learning processes described above.

GM's willingness to modify its learning objectives is related to a second facilitating factor. GM's learning processes collectively allowed redundancy to be built into the learning process. Redundancy means the conscious overlapping of company information, activities, and management responsibilities.[16] Redundancy encourages frequent dialogue and, as Peter Senge argued, dialogue is a key element of collective learning.[17] In a dialogue, complex issues are explored with the objective of collectively achieving common meaning. Dialogue involves conversations and connections between people at different organization levels. Inevitably, as issues are debated and assumptions questioned, dialogue will lead to some redundancy in information. Without a tolerance for redundancy, sharing of ideas and effective dialogue will be difficult. The learning system built by GM, and especially the TLO's contribution, is representative of necessary redundancy. Initially, there were few GM employees with the necessary skills in lean management to appreciate the NUMMI learning opportunity and there was limited interest in NUMMI dialog that went "beyond the immediate operational requirements of organizational members."[18] (Few GM executive were interested in hearing about why NUMMI was outperforming GM plants and how the reasons for this performance gap could help GM.) As the TLO developed its learning mechanisms and, in particular, as the advisor system was developed, dialog about NUMMI began and eventually escalated to the top of the company. For example, managers who returned to GM from NUMMI were expected to become teachers to other GM employees. The short-term visits to NUMMI for GM employees always incorporated an opportunity in the TLO for critical discussion.

A third factor is the climate of trust between GM and Toyota and between NUMMI and the GM organization. This trust was critical to the free exchange of information (see sidebar on Toyota's willingness to share knowledge). Finally, top management's role was an important facilitator. When NUMMI began, some GM top management people were skeptical as to the learning opportunity and few understood the potential impact if learning could be harnessed. Eventually, the top management role in the learning process evolved into one of catalyst and architect.

Overcoming the Learning Obstacles

GM had to overcome all of the five obstacles identified earlier. In doing so, the three facilitating factors supported the development of a learning system that has played a key role in strengthening GM's product quality and manufacturing productivity. Exhibit 2 summarizes the GM actions that helped overcome the obstacles and that have become key elements of the on-going knowledge transfer and learning process.

The results of this study are consistent with research in the learning transfer area.[19] Successful knowledge transfer and learning will not occur until the organization has the capacity to learn and the requisite mechanisms in place to facilitate knowledge transfer and knowledge assimilation. Within GM, there was

Toyota's Willingness to Share knowledge

For many observers of NUMMI, Toyota's willingness to share its valuable TPS knowledge with GM has always been somewhat of a puzzle. I have been asked the following question many times: "Now that Toyota has its own plants in North America, why does the firm continue to share knowledge with a competitor?" Yes, GM and Toyota are major competitors on a global basis and Toyota has extensive wholly owned operations in Kentucky, Indiana, Ontario, and elsewhere. Nevertheless, there are several reasons why Toyota remains a partner with GM and, in doing so, provides a unique and valuable learning opportunity for GM. First, GM and Toyota, despite being competitors, have a strong partnership with senior management support on both sides. Perhaps more so for Toyota, given its Japanese roots, there is the view that partnerships that endure for many years with no obvious problems should be maintained and supported. Moreover, in typical Japanese corporate fashion, close partners usually share information. Second, Toyota has always been proud of its manufacturing leadership position and has openly shared the TPS with outsiders. Among the many books written on lean manufacturing are a number by Taiichi Ohno, the Toyota executive who, along with Shigeo Shingo, developed the principles underlying the TPS. Ohno wrote "Toyota Production System: Beyond Large-Scale Production" when he was an executive vice president at Toyota. Third, although Toyota has shared aspects of the TPS, Toyota has proprietary engineering and manufacturing processes that are not accessible via the partnership (as does GM). In other words, Toyota is not giving away all of its crown jewels. Fourth, learning in NUMMI goes both ways: Toyota has learned and continues to learn from GM. GM has played a key role in the management of NUMMI and has contributed critical knowledge in areas such as plant safety, materials handling, and workforce management. The NUMMI plant manager during the complex introduction of several new models in 2001-2002 was from GM, not Toyota. Finally, from a public relations perspective, Toyota's choice to remain a loyal GM partner is probably a wise one given the highly politicized nature of the U.S. automobile industry.

outright resistance to learning in 1984. Once the resistance was eradicated, there was a need to create a sustainable learning process. The TLO was established early because there was a desire to learn. However, the first 8-10 years were filled with a variety of mistakes and missteps, lack of the proper systems in place, and the need to eradicate the Not Invented Here Syndrome.

Lessons From the GM Experience

From this case study, several further lessons can be drawn for other firms seeking to exploit learning and knowledge transfer opportunities:

- *Successful organizational knowledge transfer requires both moving the knowledge and changing the recipient's knowledge.* The individuals moved from NUMMI to GM possessed unique ideas but both the attempts to codify the ideas into principles and the usefulness of the codification encountered barriers, mainly from individuals with limited exposure and understanding of the TPS system. Until GM knowledge was changed, or modified, and

EXHIBIT 2. Learning Obstacles and GM Actions

Learning Obstacle	GM Actions that Helped Overcome the Obstacles
Causal Ambiguity	Training; visits to NUMMI by GM and supplier employees; sharing of information facilitated by the TLO; creation of a network of NUMMI-experienced managers; direct involvement of GM leadership; and time (about eight years before real learning began).
Lack of Leadership Commitment to Learning	Jack Smith appointed CEO in 1992; former NUMMI advisors promoted within GM; GM leaders develop an understanding of lean production.
Unwillingness to Invest in Learning	Expansion of the scope of the TLO's mandate to encompass a broad set of learning activities; replication of the TLO for several GM plants.
Failure to Build a System that Captures the Learning of Individual Managers	Development of the advisor system (personal development requirements; GM mentors, planned re-entry assignments, etc.); learning network of NUMMI alumni; NUMMI assignments became recognized within GM as important and desirable developmental experiences.
Not Invented Here Syndrome	Learning network; experience with lean manufacturing in NUMMI; Eisenach and other plants; superior performance within NUMMI relative to other GM plants.

combined with knowledge from NUMMI, the knowledge transfer was destined to remain minimal.[20] To change the knowledge held by the GM organization, extensive communication had to occur between individuals with an understanding of NUMMI and the groups that were responsible for manufacturing. The change occurred via training, visits to NUMMI, sharing of information, creation of a network of NUMMI-experienced managers, and direct involvement of GM leadership. The most important knowledge that had to be changed was that possessed by the firm's leadership. When NUMMI was formed, GM leadership had a very limited understanding of the learning potential and some of the leaders were openly opposed to collaboration with Toyota. Until these leaders's views changed, or the leaders themselves were replaced, knowledge transfer could not have a strategic impact. Fortunately for GM, three things happened. First, a core group of middle managers who embraced NUMMI ideas became senior executives within GM. Second, Jack Smith became committed to NUMMI and lean manufacturing in the mid-1980s and was able to have a strong influence on other firm leaders. Third, GM leaders embraced the notion, adapted from Toyota, that effective leaders have to know the system and they have to be able to able to teach it.

GM has ensured that the TPS principles are adapted to the GM context, which differs in significant ways from Toyota's. For example, changes at GM must involve the United Auto Workers whereas Toyota's plants are non-unionized. By adapting the TPS, GM has allowed the organization to maintain its own identity and develop what GM calls its Global Manufacturing System (GMS). GMS was designed to transform

multiple ways of manufacturing into a single method. The principles are directly adapted from the TPS: people involvement, built-in-quality, standardization, continuous improvement, and short lead times. Commonality of process is key to GMS, coupled with a global vehicle architecture strategy and an emphasis on putting flexible manufacturing tools in the plants.[21]

- *Knowledge transfer effectiveness can be actively managed and improved upon.* Although many firms strive to become learning organizations, the reality is that few actually understand how to create the type of managerial processes that can effectively transfer knowledge between and among organizational units. In the alliance context, it is unrealistic to expect that knowledge transfer will happen just because individuals are exposed to new knowledge. As GM discovered, until a learning infrastructure was in place, efforts to transfer knowledge generated only sporadic positive results. As an effective knowledge transfer system emerged, GM recognized the importance of active intervention and purposefully created organizational mechanisms to capitalize on the NUMMI learning opportunities. The mechanisms include the advisor system, the TLO, and the use of greenfield plants to showcase lean manufacturing.
- *Learning requires experimentation and innovation.* To some observers, GM's long involvement in NUMMI is evidence that GM has not been very successful in learning from NUMMI. Why, ask the skeptics, has it taken GM 20 years to learn from NUMMI? There is no question that, in retrospect, GM made numerous mistakes in trying to learn from NUMMI and did not exploit an opportunity to gain a significant first-mover advantage via early exposure to the TPS. The years 1984-1992 were not as productive from a learning perspective as they could have been because many GM leaders discounted the learning opportunity, NUMMI advisors were not properly prepared for their assignment and GM re-entry, GM did not initially understand the underlying principles of the TPS, and so on. As a result, learning began at a very slow rate and almost a decade of valuable time was lost. During that decade, many of GM's senior managers were unable to understand the value of the TPS knowledge and unwilling to develop the understanding.

  As GM gained experience in the joint venture, corrected some early mistakes, replaced the leadership, and developed a knowledge transfer system, learning was able to occur. More importantly, the learning did not stop and is still happening two decades later. In addition, it took some time to get a knowledge transfer system in place. According to a GM manager, "We had NUMMI, but we had to experiment as to how to exploit the learning opportunity." For the small number of managers that initially saw a valuable learning opportunity in 1984, there was no template that could be applied to the NUMMI situation. The knowledge transfer processes that emerged had to be invented by GM. In retrospect, some of the processes, such as ensuring that advisors were properly

selected for NUMMI and adequately prepared for re-entry to GM, are quite obvious and GM rightfully deserves to be criticized for not implementing them earlier. However, given the lack of understanding that existed about the TPS before the venture was formed, some early mistakes in creating a knowledge transfer system were inevitable. Experimentation and a willingness to persevere through the early days of the venture ultimately resulted in valuable learning (albeit, one can only speculate as to where GM might be if significant knowledge transfer had been initiated much earlier).

Other firms trying to exploit an alliance learning opportunity should not be scared off by the challenges of successfully capturing alliance knowledge. Many of the knowledge transfer mechanisms used by GM can be quickly implemented if there is a clear understanding of the learning objective and if the barriers to learning can be overcome. Moreover, as GM's experience shows, a willingness to invest resources in developing an innovative knowledge transfer system can yield results that go far beyond a one-way transfer of knowledge from alliance to parent. Learning should not be viewed as a discrete outcome, but as an ongoing process.

- *Knowledge transfer is all about ties between people.* All too often, firms assume that organizational knowledge can be managed by establishing databases of factual information that can be digitally stored and accessed by people throughout the organization. There is no doubt that some knowledge can be reduced to digitized form and easily transferred within an organization. However, complex knowledge with real strategic value must be managed and transferred through social networks, not computer networks. One of the key lessons is the value of social learning networks and the need to actively build, nurture, and replicate the networks throughout the organization. GM's decision to replicate the TLO concept in various locations is an indicator of the commitment to building knowledge ties between various parts of the organization. Moreover, GM's learning success is, in large part, due to the initiative of middle management personnel. This suggests that other companies seeking to exploit alliance learning objectives should put the best people possible into the network, provide the infrastructure to support that network, and promote the "learning-enabled managers" to positions of leadership.
- *The learning value of most alliances is usually greater than managers understand and appreciate when alliances are new and recently formed.* When alliances are in the formation process, the emphasis of the partners is usually on issues such as compatibility, commitment, and convergence of partner interests. Learning opportunities are relegated to a secondary position, or they are completely ignored in the interests of closing the deal and making the alliance an operating entity. Alliances will almost always create learning opportunities. The real issue is knowing what they are and creating an environment where they can be exploited. With NUMMI, the most significant impact on GM performance has been in the areas of manufacturing

productivity and quality. NUMMI also has played a key role in GM's international greenfield expansion, in training managers in areas such as repair and plant management, and, perhaps most importantly, in providing critical understanding of Toyota as a competitive threat.

To properly assess the learning value of alliances, firms must have a solid grasp of what they know (and don't know). Fortunately, NUMMI has lasted long enough to allow GM to develop a critical sense of the value of learning. In contrast, many alliances are short-lived and by the time a learning opportunity is identified, the alliance is on its last legs. Thus, an early assessment of learning opportunities is essential.

- *Knowledge must be leveraged across the organization to generate real returns.* As knowledge gets transferred and put into use, its value increases and the network of knowledge also expands, which creates further opportunities to exploit the value of the knowledge. From an initial starting point of a few advisors in NUMMI, GM built a network of knowledgeable managers, engineers, union officials, suppliers, and line workers who each became nodes in the knowledge network. As each individual connected with new people, the network expanded, increasing the penetration of the valuable knowledge. The result is that GM is a stronger organization that has developed a learning capacity and an understanding of how to transfer and exploit knowledge.

APPENDIX
Research Methodology

The majority of data was collected via interview with GM managers. Interviews were conducted in person and via telephone. Site visits were conducted at NUMMI, the NUMMI Technical Liaison Office, GM Argentina in Buenos Aires, and GM plants in Rosario and Cordoba, Argentina and Orion Township, Michigan. In total, more than 45 current or former GM managers were interviewed along with several outside observers and a number of hourly employees. The GM managers came from various backgrounds; the common thread was a connection to NUMMI and the knowledge transferred from the joint venture to GM. I interviewed some of the original GM managers assigned to NUMMI, managers who worked at NUMMI during the period 1984-2002, and managers on assignment in NUMMI in 2002. I also interviewed current and former GM plant managers and corporate managers involved in various aspects of manufacturing and quality. Data were collected in Argentina because Argentina was one of the sites for a greenfield plant using knowledge transferred from NUMMI. In conducting the interviews, I learned that there was a network of managers within GM that shared a NUMMI connection and that fervently believed in the NUMMI's value as a learning opportunity for GM. I also consulted published reports on NUMMI and some internal GM documents written when NUMMI was formed. The published reports helped establish the historical context for the joint venture.

Interview questions depended on the respondent's experience. For respondents who had worked in NUMMI, I focused on three main areas: the respondent's personal history in GM and NUMMI; the impact NUMMI had on the respondent's career in GM; and the impact their NUMMI experience had on GM. For other respondents, I was interested in their assessment of the impact NUMMI had on GM and how that impact had been managed. For all respondents, I asked: "What is (or was) your involvement with NUMMI" and "How has NUMMI impacted GM?" There was a high degree of consensus among the GM interviewees.

Notes

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Exhibit J

6/19/09 Grand Rapids Press A9
2009 WLNR 11907467

Grand Rapids Press, The

June 19, 2009

Section: Business

GM kills Vibe brand
Automaker will quit making hatchback in August

Tom Krisher / The Associated Press

DETROIT -- The Vibe is the latest Pontiac model to be officially killed by General Motors Corp. as the automaker moves to phase out the storied brand next year.

GM said Thursday it will stop making the small hatchback in August at a factory it runs with Toyota Motor Corp. in Fremont, Calif.

The Detroit automaker, as part of its government-funded restructuring in bankruptcy protection, is shedding Pontiac, Hummer, Saab and Saturn as it tries to shrink itself to match a smaller market share and get more mileage out of its advertising dollars.

The Vibe, the same car as the Toyota Matrix, was not a huge seller for GM. Through May, the company sold only 11,395 Vibes, down 35 percent from the same period last year.

GM said in a statement it is talking with Toyota about a replacement vehicle for the Fremont factory, known as New United Motor Manufacturing Inc., or NUMMI. The plant also makes the Toyota Corolla and the Tacoma pickup.

Toyota spokesman Mike Goss denied reports Toyota would build the Prius, the nation's top-selling gas-electric hybrid, at the plant.

The Japanese automaker, he said, has built a new factory in Tupelo, Miss., to assemble the Prius but is not equipping the plant for production until auto sales recover.

"We haven't changed our minds. We still plan to build the Prius in Mississippi when the market dictates," Goss said. "NUMMI is not under consideration for that. General Motors and Toyota continue to talk about the

future of NUMMI, and we just don't know what the result of that is going to be."

Toyota will continue to build the Corolla and Tacoma at NUMMI, Goss said.

NUMMI was set up as a joint venture in 1984. One of its purposes was to have American workers learn Toyota's production methods. It has been the topic of numerous labor relations studies, and the company claims teamwork and safety among its "core values."

Despite the end of the Vibe, GM is not pulling out of the joint venture with Toyota, and the companies are discussing other GM products that could be built at the factory, Pontiac spokesman Jim Hopson said.

"It's certainly been a very lucrative partnership for us," he said.

GM already has announced it would end production of the Pontiac Solstice roadster in July and the Pontiac G6 midsize car in September.

The end of production for the remaining three Pontiac models, the G8 muscle car, G5 compact and G3 subcompact, will be announced shortly.

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NEWS SUBJECT: (Major Corporations (1MA93); Corporate Restructuring (1RE42); Business Management (1BU42))

INDUSTRY: (Automotive (1AU29); Automobiles (1AU45); Automotive Models (1AU61); Land Transportation (1LA43); Transportation (1TR48); Four Wheel Drive (1FO31); Passenger Transportation (1PA35); Manufacturing (1MA74))

REGION: (North America (1NO39); USA (1US73); Mississippi (1MI74); Americas (1AM92); Washington (1WA44); Michigan (1MI45))

Language: EN

OTHER INDEXING: (COROLLA; GENERAL MOTORS; GENERAL MOTORS CORP; GM; HUMMER; NUMMI; PONTIAC; PONTIAC SOLSTICE; PRIUS; SAAB; SATURN; TACOMA; TOYOTA; TOYOTA COROLLA; TOYOTA MATRIX; TOYOTA MOTOR CORP; UNITED MOTOR MANUFACTURING INC; VIBE) (Goss; Jim Hopson; Mike Goss)

KEYWORDS: Issue

EDITION: All Editions

Word Count: 490
6/19/09 GRPR A9
END OF DOCUMENT

Exhibit K

June 29, 2009

GM ends joint venture with Toyota at Calif. plant

DAN STRUMPF
AP Auto Writer

NEW YORK_General Motors Corp. said Monday it is ending its joint venture with Toyota Motor Corp. at a Fremont, Calif., manufacturing plant, bringing to a close the first partnership of its kind between a U.S. and foreign automaker as GM continues to downsize under bankruptcy.

The Detroit automaker said it was unable to reach an agreement with Toyota over a new product plan at the facility. The plant, called New United Motor Manufacturing Inc., or Nummi, currently makes the Pontiac Vibe station wagon for GM and the Corolla compact car and Tacoma pickup truck for Toyota.

GM announced it was phasing out the Pontiac brand earlier this year. The facility will cease production of **GM** vehicles in August, the company said. A Toyota **spokesman** said the Japanese automaker is weighing its next move for the plant, which employs about 4,600 workers.

"The economic and business environment surrounding Toyota is also extremely severe, and so this decision by **GM** makes the situation even more difficult for Toyota," company **spokesman** Mike Goss said.

He said Toyota is disappointed to see the partnership end, but declined to comment further, including on whether the plant would close.

"We have enjoyed a very positive and **beneficial partnership** with Toyota for the past 25 years and we remain open to future opportunities," Troy Clarke, **president** of **GM** North America, said.

For Fremont, where the **Nummi** plant is the city's largest employer, the effects of GM's pullout remain uncertain. Fremont Mayor Bob Wasserman said while GM's move comes as no surprise, he's still trying to weigh the affect it will have on the plant.

Wasserman said the decision is a sign of the troubled economic times in California, which already faces a $24 billion budget shortfall and has a record 11.5-percent unemployment rate.

"We're hoping for a turnaround, but it appears there will be more damage before that happens," Wasserman said.

GM's announcement on Monday brings to an end a partnership first established in 1984. One of its purposes was to have American workers learn Toyota's production methods, which were much leaner and more efficient. The factory has been the subject of numerous labor relations studies.

Nummi was also Toyota's first plant to build vehicles in North America and marked a major escalation for the automaker in the U.S. market. Toyota now has more than a dozen manufacturing facilities in North America, which build most of the company's U.S.-sold vehicles.

GM, which filed for Chapter 11 bankruptcy protection earlier this month, is laying off employees, closing dealerships, shuttering factories and shedding four of its eight brands as part of a vast reorganization effort. The automaker said its 50-percent stake in Nummi will become part of the "Old GM" that will be liquidated under

bankruptcy.

On Tuesday, a New York bankruptcy court is scheduled to rule on the proposed sale of GM's desirable assets _ also called the "New GM" _ to a new company that will be majority-owned by the U.S. government.

The Vibe station wagon has been a poor seller for GM recently. Sales rose 25 percent in the down market in 2008, but have tumbled 47 percent for the first five months of this year.

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Associated Press writer Terry Collins in San Francisco contributed to this report.

---- INDEX REFERENCES ---

COMPANY: GENERAL MOTORS CAPITAL TRUST D; TOYOTA MOTOR CORP; DAIHATSU MOTOR CO LTD; GENERAL MOTORS CORP ELECTRONIC DATA SYSTEMS CORP; TOYOTA; TOYOTA MOTOR NORTH AMERICA INC; GENERAL MOTORS CORP

NEWS SUBJECT: (Joint Ventures (1JO05); Major Corporations (1MA93); Financially Distressed Companies (1FI85); Corporate Financial Data (1XO59); Bankruptcies (1BA08); Labor Relations (1LA21); HR & Labor Management (1HR87); Layoffs (1LA48); Business Management (1BU42); Business Failures (1BU16))

INDUSTRY: (Automotive (1AU29); Automobiles (1AU45); Land Transportation (1LA43); Automotive Models (1AU61); Transportation (1TR48); Passenger Transportation (1PA35); Manufacturing (1MA74))

REGION: (North America (1NO39); New York (1NE72); USA (1US73); Americas (1AM92); California (1CA98))

Language: EN

OTHER INDEXING: (COROLLA; GENERAL MOTORS CORP; GM; NUMMI; PONTIAC; PONTIAC VIBE; TOYOTA; TOYOTA MOTOR CORP; UNITED MOTOR MANUFACTURING INC; VIBE) (Bob Wasserman; Mike Goss; Terry Collins; Troy Clarke; Wasserman) (GlobalDistribution) (Japan; JPN; Asia; United States; USA; NorthAmerica)

KEYWORDS: (f); (3300); (Automotive); (Financial); (Business); (Travel); (Labor)

COMPANY TERMS: TOYOTA MOTOR CORP

TICKER SYMBOL: TM

Word Count: 653
6/29/09 APDATASTREAM 21:20:49
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