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Summary: Chrysler had the most coherent CAD and PDM strategy of any car company. It is now facing extinction not only because of high costs, but because its designs are inferior to the competition. What can the auto industry survivors and engineers in other fields learn from Chrysler's history? Contributing Analyst Steve Wolfe takes a close look at the case of Chrysler and asks, "Does a CAD or PLM strategy matter?" (April 16, 2009)

The Case of Chrysler: Does a CAD or PLM Strategy Matter?

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April 16, 2009—In February, I did something I may soon regret: I bought a new Chrysler Town and Country minivan to replace my 10-year-old Toyota Sienna. I had planned for the Sienna to be my last van, but after some discussion, my wife and I decided that a van would be the best vehicle for her two-year-old [San Diego Insider Tours](#) business.

Like most engineers, I take car purchases seriously, so I shopped carefully. I read reliability statistics and got preliminary prices on line. I narrowed my choices to another Toyota Sienna or a Dodge Caravan because the top-rated Honda Odyssey was in short supply and more expensive than the other two.

I visited Chrysler and Toyota dealers to inspect the cars and drive them, and I got a quotation for an eight-passenger 2009 Sienna that was \$1,100 less than I paid for my seven-passenger model in December 1998. In ten years, the Consumer Price Index has risen by 28% while the price of Toyota minivans has fallen by 4%.

I would have paid a little more for a Toyota Sienna than I was willing to pay for a Dodge Grand Caravan because I like the design better. The Sienna also has better reliability, although my 1999 model with a six-cylinder engine subject to oil burning was no mechanical prize. The Toyota's carpeting and upholstery is better coordinated and seemed richer than the Dodge. The exterior lines of the Toyota are smooth and flowing.



The Chrysler Town and Country: "A little awkward, like an ill-fitting suit" but "so cheap I couldn't resist."

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The Chrysler models are boxy. Both cars handle equally well and get equal mileage. But the Toyota with its five-speed transmission has more power. And when I sat in the driver's seat of the Toyota, all the controls and instruments seemed to be in the right place. In contrast, the Chrysler models seemed a little awkward, like an ill-fitting suit.



The Toyota Sienna: “Better design, better reliability,” and 4% cheaper than 10 years ago.

To appease our seething Detroit readers, let me say that I am not a Japanese car bigot. My first car, bought at age 16, was a Chrysler Plymouth Valiant. My first new car, bought when I graduated from college, was a Plymouth Duster. My first minivan was a Plymouth Voyager. And I did end up buying a new 2008 Chrysler Town and Country because it was so cheap I couldn't resist.

But the Chrysler models are, by every objective measure, inferior in design and engineering to the Japanese-owned competition. (Both cars are assembled in North America.)

My visits showed me that Chrysler dealers are under stress. In National City, a suburb to the south of San Diego, the Dodge dealer had “GOING OUT OF BUSINESS SALE” in four-foot-high letters painted on the showroom windows. And he meant it. Paperwork had to be processed at the nearby Chrysler-Jeep dealer. Chrysler showrooms are aging compared with the sparkling Toyota dealers in San Diego country. And Chrysler's computer systems for quoting prices, gathering credit information, and processing sales documents look like relics from the 1980s. Toyota's systems are modern and practically paperless.

Given all the money it would take to upgrade Chrysler's designs and distribution systems, it is hard to imagine the venerable automaker surviving in light of January's 55% year-to-year sales drop. That Fiat, long the sick man of Europe's auto industry, could save Chrysler when Daimler could not appears wishful thinking.

The Failure of PLM?

I don't pretend to know all the reasons why Chrysler got to its current state. But I do know a lot about its PLM strategy. More than any other company, Chrysler pursued a strategy of dealing with one primary CAD supplier, Dassault Systèmes' CATIA business unit. Since the 1980s when it phased out its home-grown CAD system in favor of CATIA, Chrysler aggressively routed all other CAD systems out of its engineering and manufacturing offices. When PDM began to become important, Chrysler chose Dassault Systèmes as its sole supplier and aggressively adopted each new PDM system offered. When Dassault Systèmes rolled out CATIA V5, Chrysler was among the first of the auto builders to put it in production.

Over the past quarter century, I have been a guest at Chrysler's Auburn Hills

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headquarters or its Outer Drive manufacturing engineering plant on at least five occasions. Each time, Chrysler managers explained their single-supplier strategy clearly. There could be no mistake about what Chrysler was trying to do, and by most accounts, the company did what it said.

If we are to believe the sales pitches of the CAD and PLM vendors, Chrysler's strategy should have given it both cost and speed advantages. By eliminating the overhead associated with translating CAD drawings and models among incompatible systems, Chrysler should have been able to design new products and the tools to make them faster and better. A frequent argument from PLM vendors is that their software enables companies to be more nimble, to verify the quality of their designs with less physical testing, and to design derivatives of new products quickly.

All of these advantages should have accrued to Chrysler, but they didn't. Why not?

Misguided Priorities

Books will be written over the coming decades about the reasons for Chrysler's failure. High labor costs, excessive retiree benefits, poor workmanship, unattractive designs, an inefficient dealer network, and the wrong mix of vehicles all played a role. As the smallest of the three US car makers (before Daimler bought it), Chrysler lacked the financial resources of Ford and GM. However, Honda ranked fifth in US market unit sales in March 2009, yet it excels in all the areas in which Chrysler is deficient.

The fact that all three US car makers are in dire financial straits suggest that something about the American style of managing companies rather than technological shortcomings is responsible for Chrysler's demise. That Jim Press, who successfully ran Toyota's US operations before becoming Chrysler's second-highest executive, hasn't alleviated Chrysler's problems suggests that not just top managers, but the entire managerial system within US car makers is dysfunctional.

The culture that brought Detroit to its current state has been generations in the making. At its root is a sense of entitlement without obligation. Everyone at the former big three from the workers on the line to the chief executive cares only about himself. To earn bonuses for a few years, executives boosted profits by under-investing in manufacturing plants, product development, and dealer infrastructure. With threats of strikes, union workers demanded and got unsustainable wages and retirement benefits. Those in between climbed the managerial ladder by minimizing costs in their departments (or worse, maximizing the number of people under their command) rather than caring about the efficiency of their companies as a whole.

The self-interested culture didn't care about providing its customers with superior products. Any vehicle was deemed good enough if it met cost targets. Innovation was discouraged if it reduced short-term profits (and therefore current-year bonuses). The whole system worked well for employees both high and low until Japanese automakers learned how to build superior products at lower costs than the home-grown manufacturers. Then GM, Ford, and Chrysler began losing market share.

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Anyone who has seen the Japanese car companies up close knows they are far from perfect. Moreover, there is nothing inherently wrong with self-interest. But in a collaborative enterprise—whether it be baseball or making complex machinery—everyone who joins the team must balance personal interests against the interest of the team. In such enterprises, it is the success of the team and not the individual that assures long-term prosperity for all.

Chrysler's designs today aren't inferior because it chose bad CAD tools. Its cars aren't as good because the people who design and engineer them don't care as much as the competition about making outstanding products. When finance people say "hurry up," "it's good enough," or "make it cheaper," people who have had their pride of workmanship beaten out of them choose the easiest path.

Chrysler is hopeless, and the sooner it is liquidated, the more likely Ford and GM will survive. But if the remaining US manufacturers of all types are to live and prosper, their leaders must foster cultures that care about creatively reducing costs without compromising the customer experience. They need to encourage creative risk taking without being reckless. And they must encourage cooperation at the expense of narrow self interest.

Applying these principles to engineering software, workers who won't learn more productive new software because it requires time and effort should be chastised. Conversely, information technology managers who force inefficient software on engineers in order to reduce IT budgets must not be allowed to have their way. Engineering managers should be allowed the internal development budgets needed to reduce the labor required for repetitive tasks by automating them. And everyone should be encouraged to speak up when software is unreliable or fails to deliver promised benefits.

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