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News

GM's REUSE STRATEGY

Parts reuse based on a common database will reduce engineering time, save money, and serve global ambitions

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WHEN GENERAL MOTORS CORP. set out to design its Cadillac XLR, a flashy new two-passenger roadster with a retractable hardtop, it borrowed the frame from Chevrolet's Corvette, a classic American sports car.

GM's Opel European subsidiary will use the Epsilon 2 auto-body structure in its next-generation Vectra, a car model that will go on the market by 2009. That auto-body structure also will appear in a new North American Saturn crossover vehicle by the end of the decade. Soon, there will be even greater opportunities to easily share parts used in GM's European- and Asian-brand cars.

More mixing and matching will be possible because GM is expanding its parts database of 40,000 3-D CAD models—representing everything from gas caps to headlamps to suspension systems—for its North American vehicles to incorporate information on parts used in cars built for the European and Asian markets, which often conform to different regulatory requirements and standards. By year's end, the database will include Europe-specific parts information, and, soon after, parts data for the Asian market will be added. When the project is complete, GM expects the data—

now accessible to more than 10,000 GM engineers, suppliers, and joint-venture partners worldwide—will be available to 60,000 users. "There's a huge emphasis on reusing common parts," explains Tony Scott, CIO of GM Information Systems & Services. "You will see the results in reduced cost, improved quality, and faster time to market."

The company's goal is to reuse 40% to 60% of parts across its brands, as it ramps up both the number of new car rollouts and its global ambitions. GM will have a record 29 product launches worldwide this year, Maryann Goebel, CIO at GM North America, told attendees at *InformationWeek's* Fall Conference last week. The company expects that about 60% of its estimated growth will come from emerging economies in Asia, Eastern Europe, and South America.

The automaker isn't the only domestic manufacturer determined to increase parts reuse among its brands. Ford Motor Co. last week confirmed that it plans to share more Jaguar components and technologies with other Ford luxury brands. Such efforts are "critical for [automakers] to compete, not only in North America but now in Europe and Asia," says AMR Research analyst Kevin Mixer. Parts reuse can decrease engineering time by 60%, Mixer estimates, no small consideration since the number of new models introduced increases by about 40% a year. But domestic automakers have a

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lot of catching up to do with Japanese carmakers, including Toyota and Honda, which have a five-year head start when it comes to sharing designs. Engineers at GM, Ford, and DaimlerChrysler prefer to design new parts, Mixer says, so there needs to be a change in corporate cultures if those companies are to get maximum value out of databases that make it possible to reuse parts.

GM already has a platform in place to take advantage of the parts models that are or will be stored in the database. Using UGS Corp.'s PLM Solutions Teamcenter design and product-life-cycle-management software, it can plug existing parts data into evolving vehicle designs; after searching a parts library, engineers will be able to make changes to those parts as needed to fit the overall car design, and automatically test for manufacturability, quality, and other features. Around the globe, roughly 10,000 CAD files are synchronized nightly among GM designers and partners at 15 major design centers. That system already has helped reduce the engineering cycle time from 48 months to 24 months and, in some cases, to 18 months. GM also has saved hundreds of millions of dollars in engineering costs.

The database and the UGS application are part of GM's "Math Pipeline," a series of applications and business processes that promote collaboration and standardization, from vehicle concept through manufacturing. "The database is a repository we expect engineers and suppliers to access first to see if it's possible to use or modify an existing design," Goebel says.

Joint-venture partners also can use any application or database in the Math Pipeline. Fiat Auto SpA of Italy and Suzuki Motor Corp. of Japan—GM holds a minority stake in both—collaborated with GM engineers in the design of the HFV-6 engine. That's now used in three Cadillac models, two Buick designs, and three of GM's Australian-brand Holden cars, as well as in Suzuki and Fiat models. "We want to act as one company," Goebel says. "We want to make it easier for partners and suppliers to do business with us as a hub of commerce."

If there's a downside to collaborative parts reuse, it's that a flawed part may wind up in multiple car models and brands. Auto manufacturers recalled more than 14 million vehicles in North America halfway through the second quarter of this year, 2.5 million more than in all of 2003, Mixer says. The high level of parts reuse shares in the blame for that, he contends. A class-action suit recently filed in Canada against Ford alleges that defective door latches on as many as 400,000 pickups and sport-utility vehicles caused the doors to open in side-impact crashes and rollover accidents, and, Mixer suggests, the reuse program at Ford is the reason several models have turned up with these latches. A Ford spokeswoman says customer safety is a top priority and that the components were properly certified.

GM believes that parts reuse will lead to increased quality and fewer recalls when engineers grab parts for which there's good data on reliability. It's forging ahead with the effort, which is tightly entwined with its plans to compete as a global car company. Between 70% and 80% of GM's total IT investment each year is spent on creating and deploying common systems that can be used around the world. After all, when it comes to reusing parts and sharing technology, why reinvent the wheel?

General Motors wants to reuse between 40% and 60% of its parts across brands. "We want to act as one company," CIO Goebel says.