The automotive industry today is in the middle of a dramatic and largely unprecedented transformation. The heart of this transformation is not about how the auto company does its work but rather how it defines itself. The model of the car company that Henry Ford created and Alfred Sloan perfected—integrated, scale-driven, “product-push”-oriented—prevailed for decades. It drove the consolidation of the U.S. industry from dozens of manufacturers to four to three to two-and-a-half (which then, with a little push from a visible hand, recovered to three). It governed the development of the post-war European industry, albeit with fits and starts engendered by that region’s distinctive social and cultural politics. And it was the model upon which the Japanese manufacturers relied as they shot up the global league tables having made timely and effective adaptations that were overlooked, for a while, by the once-dominant U.S. industry.

Today the traditional model of the auto company is under direct attack. Alternative visions and concepts have emerged for every piece of value that the traditional car company adds—designing cars, engineering them, manufacturing them (at least the important bits), assembling them, and marketing them. These visions and concepts are not just being tested on paper but through experiments that are getting ever bolder and more daring. Some industry commentators have speculated about the possibility of creating a “virtual” car company along the lines of a Gateway or a Dell. Last summer, the trade press was full of breathless reports that the largest independent auto retailer, [continued on page 2]
AutoNation, might one day have sufficient market power to command private-brand cars, ordering them like shoes or dresses from some Pacific Rim sweatshop. Whatever one thinks about the reasonableness or practicality of these ideas, that they are given voice at all is representative of the scale and scope of change.

It is also possible, if perhaps more contrarian, to imagine a conjunction of technological, market, and economic forces that can overcome the relentless gravitational pull of scale. The conventional wisdom is economic pressures will force the auto industry to collapse to perhaps six major players, two in each of the three legs of the “triad” (North America, Western Europe, Japan).

However, there is little if any correlation between absolute size and shareholder value creation. Exhibit I illustrates the relationship between market value (expressed as a percentage of sales) and global market share for leading auto companies at the end of 1998. A few companies—Toyota, Honda, BMW, and Volvo before the sale of its car division to Ford—commanded premium valuations reflecting the strength of their brands and business systems. But General Motors, still the largest vehicle manufacturer (VM) measured by market share, was valued at a rate similar to Fiat, PSA, Renault, and Nissan.

Will advances in information and process technologies work together to reverse the long trend of consolidation and confer competitive advantage on the small, the nimble, and the quick? The purpose of this INSIGHTS is not to predict an outcome. It is futile to try to define the future shape and structure of an industry as large, as complex, and as politically central as the auto industry. Instead, this INSIGHTS attempts to drive to an understanding of the economic forces at work in the auto industry today and the choices that these forces create for automakers. Future INSIGHTS will address the implications of those choices for strategies and performance.

**Five Challenges**

Most of the challenges the automotive industry will face in the next 10 or 20 years can be identified today. They are shaped by changes in the underlying economics of the auto business, from supplier through consumer, and by definition they are sufficiently broad to be of interest to all the participants in the industry.

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We have distilled the five macro challenges described below from our research and client experience.

I. Globalization

North America, Western Europe, and Japan are home to 18 of the top 20 VMs in the world and account for nearly 90 percent of global production. All three of these regions are mature automotive markets, with low expected unit growth rates (negative in Japan) and capacity in excess of regional demand. VMs therefore have turned their sights toward growth opportunities in emerging markets: Latin America, North and South Asia, China, India, Eastern Europe, and Russia. These markets are forecasted to grow at more than double the average industry rate over the next ten years. The headlong rush of VMs to set up greenfield assembly sites in these markets suggests a profound faith in the value and durability of first-mover advantages.

The economics of this globalization are troubling. Governments in the developing markets know that their prospective growth has value, and it is perfectly rational for them to auction off that growth potential to the highest bidders. As car companies vie for market share and add manufacturing capacity in order to build where they hope to sell, they bid away the economic returns to themselves and exacerbate the overcapacity problem on a larger scale. Government policy towards the world’s largest manufacturing industry drives much of this behavior. Automotive national industries, local content laws, and financial bailouts of uneconomic plants disrupt the workings of the market, drive up costs, and transfer wealth from VMs to labor and government. Sometime in the future, these factors will ultimately reduce the VMs’ already low return on investment and force another round of painful industry rationalization. While every automotive executive is aware of the problem, each feels compelled to compete to be the market winner.

Globalization is neither cheap nor easy at any point along the value chain. Emerging market customers increasingly demand the same levels of quality and technology as customers in mature markets. Local content rules and supply chain economics dictate that suppliers establish their own manufacturing close to (if not co-located with) assembly facilities. Thus far, the VMs have been able to entice suppliers to accompany them on their global adventures using the carrot-and-stick of global supply contracts. But there are signs of growing unwillingness within the supply community to invest their capital dollars in plants that might not reach full utilization for 15 years, and a number of suppliers are considering throwing in the towel rather than gamble.

Finally, VMs are still struggling

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Challenges Facing the Global Automotive Industry
(continued from page 3)

II. Product Differentiation

Competition for sophisticated consumers is fierce. Vehicle buyers have an abundance of choices of vehicles with increasingly similar functional and performance characteristics (see Exhibit 2). In order to increase share, maximize price realization, and use their capacity, VMs must offer differentiated products that win with consumers by addressing the fickle wants and needs in a particular locale at a point in time. Missing the market can be financially disastrous.

VMs approach the problem of differentiation from two different perspectives. The "left-brain" approach assumes that buyer wants and needs can be determined deductively through surveys, clinics, and the like. It is primarily defensive in that it seeks to eliminate negatives, to maximize the pool of potential buyers by reducing the number of consumers who might reject the product outright. The "right-brain" approach is more intuitive, striving to find a unique combination of both functional and expressive, or emotional, attributes that appeals to enough buyers so the VM can earn a decent return. It is more concerned with maximizing the depth of attraction than minimizing the breadth of rejection.

Globalization is neither cheap nor easy at any point along the value chain

The "right-brainers" sometimes hit home runs that create entirely new vehicle segments—such as Ford's original Mustang (pony cars), BMW’s 2002 (sports sedans), Chrysler’s minivan, Jeep’s Grand Cherokee (luxury SUV), and Volkswagen’s Golf GTI (hot hatch-backs). These vehicles can generate tremendous returns for the innovator for as long as it can defend its differentiated position, but genuine innovations tend to occur only once or twice per decade. Many VMs perceive radical product bets as too speculative and risky to form the basis of strategy, and focus instead on incremental improvements to concepts with proven market appeal.

The market appears to be fragmenting into ever finer and more precise segments. Niche and crossover vehicles have been extraordinarily popular of late in the developed markets. Every VM, it seems, has or soon will have a vehicle that combines some of the key attributes of SUVs (ride height, all-wheel drive) with the passenger compartment and amenities of a standard sedan. The two-seat roadster, once presumed to have died with the core of the UK automotive industry, is now more widely available than ever. And many VMs are resuscitating past market successes with new models that touch nostalgia buttons while at the same time affirming the importance of style and emotion with buyers far too young to have had any direct experience with the original vehicle.

None of these vehicles aspires to, or has any real hope of achieving, world-car production volumes. Thus VMs require a reliable innovation process to quickly and precisely deliver differentiated products that consumers will value and pay for. The challenge is to work both ends of the process simultaneously and effectively: deepening the understanding of real consumer needs and wants (both functional and expressive) to reduce the incidence of market "misses," while improving the up-front design and engineering processes in terms of the elapsed time and cost of each bet.

III. Product Development

Vehicle development is expensive, time-consuming, and risky. VMs as a group have made enormous progress reducing cycle time and cost despite growing product complexity, new technologies, and more stringent regulations. Costs to design, engineer, and tool a major new model can reach into the billions of dollars. Many VMs still rely on an expensive "cut and try" engineering paradigm, which works out key interface details in the prototype and test phase. All are looking for ways to reduce development time and cost to improve profitability and to better react to market changes.

The VM solution to the development problem has been platform commonization and the creation of derivatives. This is not new—U.S. VMs have long relied on shared components and structures for their

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families of brands. However, the GM and Ford experience of the 1970s and 1980s suggests that the pursuit of commonization, as a goal in and of itself, can lead to consumer confusion and backlash. Venerable brands like Oldsmobile, Mercury, and Plymouth lost their identities and came perilously close to being written off by their parents.

Challenges exist along two dimensions. The first is to learn how to distinguish the parts of the car where consumers are indifferent from those that are visible and important to creating and preserving brand identity. The second is to reduce the cost of development so as to be able to make product differentiation more affordable. VMs may look outside their industry for examples of fast-cycle, systems engineering development processes to facilitate a more symbiotic relationship between themselves and their suppliers for joint innovation and cost sharing. Or they may look for experience in parametric design, which can support product variation without adding undue complexity and cost.

Without systems engineering, the full benefits of the outsourcing revolution will never be realized. For VMs, outsourcing holds tremendous promise for shedding development cost and manufacturing assets. However, significant vestiges of the historical adversarial relationship with suppliers and the duplication of development effort by VM engineering departments raise costs and prevent suppliers from delivering system solutions that meet VM requirements for quality, cost, and value.

IV. Supply Chain Restructuring
For the past several decades, VMs have been preoccupied with two major supply initiatives. One of these is to reduce their overall levels of vertical integration, both to ensure that purchased parts are world-class and to reduce their fixed costs of assets and labor. (Labor contracts make labor cost behave as a fixed cost at many VMs.) The other is to reduce the number of companies that supply directly to the VM, shoving the supply base into a sort of pyramid and delegating some of the routine tasks of purchasing, production scheduling, and inventory management to their “Tier One” suppliers. For the VMs, this reduces both assets (mostly inventory, but also holding space and, in some cases, assembly line space and tooling) and operating costs.

Supplier consolidation is a double-edged sword for VMs

A more recent but equally powerful initiative is for VMs to begin to rely more fully on suppliers for “systems” and “modules.” Systems usually are defined in terms of functions—the steering system, the braking system, the “driver information” system—consisting of a number of components that are not necessarily located with each other. A supplier might be asked to engineer all or part of a system, under constraints of widely varying precision and scope, in exchange for winning the contract to supply one or more of the system’s components. A module is a number of components that may not be at all related functionally but can be assembled and supplied as a unit to final assembly. A front “corner,” encompassing components of the brake, suspension, and driveline systems, is an increasingly popular module. Seats are one of a few examples of systems that are also modules. A module supplier usually sets up a dedicated facility close to the customer’s assembly plant and ships the sub-assemblies on a just-in-time basis.

Systems and modules are a bit of a Hobson’s choice for suppliers. On one side, few can tolerate giving up the access to and “control” of the customer represented by a Tier One position. On the other, it is not immediately obvious whether and how suppliers will be paid for their expanded services.

In response, many suppliers have found it advantageous to get bigger. One way to do that is to pick up the pieces of the supply chain that the VMs no longer want. Lear Corporation, a manufacturer of seats and interior components, has grown at a 39 percent rate over the past five years, primarily by buying up seat factories from GM, Saab, Ford, and Fiat and, more recently, other interior component suppliers. Another way is to acquire other component manufacturers. The pace of this activity seems to have accelerated of late as big industrial conglomerates (such as United Technologies, AlliedSignal, Tenneco, and Cooper Industries) assess their automotive holdings against the increasingly tough market demands for shareholder value creation, and find them wanting.

Supplier consolidation is a double-edged sword for VMs. On one side, they want and need suppliers with the intellectual and financial wherewithal to fulfill their new missions. On the other, they fear that consolidation might tip the balance of power toward suppliers who to this point have been reliably compliant and responsive.

The brakes market is a good

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example of supplier consolidation. Thirty years ago, the world was awash with brake components makers. A brake system consisted of mechanical parts with simple interfaces between them, and component designs were more or less interchangeable. VMs therefore could take a “Chinese menu” approach to system design, pairing one company’s booster with another’s master cylinder and another’s foundation brake.

Anti-lock braking systems (ABS) changed all that. The ABS unit itself is a complex, “mechatronic” component half of whose value is in electronics. ABS systems have improved remarkably in the 15 years since they were introduced; costs are down by 80 percent or more, performance and reliability are up. However, competition has reduced the supply base such that there are now only four suppliers capable of designing and delivering a complete ABS system—versus 20 VMs who need to buy them. Now VMs are not so sure that four is enough; one reportedly sought out and nominated a Japanese company to join the Tier One club.

VMs must become more capable marketers and take control of the purchase experience

Suppliers must develop significant new capabilities if they are to transform themselves from assemblers or integrators into system solution providers. Delivering “black box” systems to an incomplete or vague performance specification requires a quantum leap in system level understanding, product engineering, testing, and design. Providing true solutions also entails going beyond the VM customer to the ultimate consumer in order to understand their wants and needs for an automotive system, such as suspension, braking, or seating, and their perceptions of value.

V. Marketing and Distribution

Competition for customers and the expense of differentiating products have forced VMs to look downstream for new ways to create and capture value. Two main approaches have emerged. The first, “follow the car,” is to participate more extensively in the stream of post-assembly transactions relating to a vehicle, beginning with the initial retail sale and ending at the scrap yard (or recycling center). The second, “follow the customer,” is to build and exploit more durable relationships with customers over their vehicle-buying lifetimes. Both of these require radical changes in the ways that VMs define and serve their markets.

VMs in North America and Europe are saddled with expensive, outmoded networks of franchised dealers that have lost their economic advantages and generally do a poor job of serving customers. These networks transfer VM returns to channel intermediaries while diffusing control and reducing the effectiveness of marketing programs. Consolidation has already whittled down the number of U.S. franchises. Now, in the United States, aggressive, well-capitalized retailers are seeking to build dealer networks with their own brands, threatening to further cut off the VMs from their customers. At the same time, the inefficiencies of the dealer system have spawned a host of new intermediaries promising better service, including brokers and Internet-based buying and referral services.

In Europe, protected national distribution systems are threatened by EMU convergence, which will arbitrage away remaining price differentials, and the relaxation of so-called “block exemption” rules, which confer upon new car dealers the exclusive right to sell profitable replacement parts.

In addition, the increasing popularity of leasing programs makes VMs active participants in the used car market, which is larger and growing faster than the market for new cars. In the United States, leasing accounts for almost 40 percent of new car sales. VMs now have strong economic interests in maintaining the value of used cars, both to reduce their out-of-pocket costs when leased cars are returned and to lower the cost of ownership at the first sale. This puts them at odds with their franchised dealers, who already make more money on used cars than new cars and are happy to “buy low, sell high” at the expense of captive finance subsidiaries.

To keep more of the delivered consumer value and to continue to enhance that value, VMs must become more capable marketers and take control of the purchase experience. Today, marketing at car companies consists of variations on Alfred Sloan’s product strategy (brands and models for every taste and purse) and coming up with clever ways to cut prices without appearing to do so (through financing subsidies, extended warranties, direct price incentives, and the like). VMs have not made nearly as much progress enhancing the buying and owning experience as they have on improving the quality and reliability of their products. The challenge now is to find new ways of understand-
ing, attracting, serving, and retaining customers, almost certainly by breaking through the wall of intermediaries and establishing direct contact with them.

Implications for VMs
The most sweeping and general implication of the five forces seems to us to be a gradual but irreversible diminution in the traditional power of VMs. From the inception of the industry, the VMs have occupied the central and most important seat in a Copernican universe, with large networks of suppliers and retailers stretched out around them. Because the VMs contributed the scarcest and most critical segments of the value-added chain— the ability to engineer and assemble a car and to make its most essential element, the engine—they held and exercised power over virtually every facet of their operations, either by ownership (as in the case of captive parts operations) or by contract.

The Copernican universe is changing in two specific ways. The first is that the relative size of the VMs is shrinking. Today, the largest independent supplier, Bosch, has an automotive business of some 30 billion DM. The automotive revenues of the largest VM, General Motors, are about 11 times larger than Bosch’s, down from 25 times larger fifteen years ago. Bosch itself is the same size as the smallest VMs. Suppliers are likely to grow faster than VMs as they continue to consolidate, so the relative gap should continue to decrease. Consolidation on the distribution and marketing side is just beginning to gather momentum and has not yet proven itself economically. But in only three years AutoNation has amassed dealer networks with combined new-car sales of $13 billion.

The current wisdom is that the VMs too will consolidate, and the recent press would seem to bear that wisdom out. Volkswagen started the recent wave, gobbling up some of the genteel remnants of the once-fragmented European industry (Bentley, Rolls-Royce, Lamborghini, Bugatti, Cosworth). The Daimler-Chrysler blockbuster then grabbed center stage. (Often described as unprecedented, it is in fact the second attempt at a “merger of equals” in the auto business. The first was the Volvo-Renault deal of the early 1990s, which despite all the best intentions and hopeful promises of synergies collapsed because the cultures of the two companies were as incompatible as oil and water. We can credit the boards and shareholders of Daimler and Chrysler with the same good intentions, but only time will tell how well their particular German-American vinaigrette will last.) And now Ford has wooed the perennial bridesmaid Volvo into its extended family.

The second broad change is a widespread and consistent movement of the VMs into the distribution and marketing end of the value chain. From the perspective of value-creation potential, this shift away from manufacturing toward distribution and marketing seems to make sense. It is difficult and expensive for any VM to maintain world-class scale and quality in all of the components that make up a car, and the brutal competition of the last two decades has squeezed most of the fat out of the independent suppliers and sharpened their capabilities. Distribution and marketing activities, on the other hand, still deliver very low value for cost and are ripe for transformation. The issue is not the potential but whether the VMs will be quick enough to get there first—and adept enough to stay there if they do.

Distribution and marketing activities deliver low value for cost and are ripe for transformation

Thus VMs will invest to participate much more actively in the downstream value chain. We have estimated that only ten percent of the profit potential relating to a given automobile is realized through its initial sale; 90 percent is generated downstream through financing, services, and secondary transactions. VMs today participate in something less than half of the total profit potential (primarily through their captive finance subsidiaries and spare parts operations). This greater participation in downstream auto-related businesses will allow VMs to take control of the interface with their customers. Done right, this can lead to deeper and more durable relationships and improve customer loyalty, which many studies have pointed out is influenced more by customers’ sales and service experience than by the products themselves. Direct participation also

\(^1\) To a large extent this is an outcome of a history of the VMs with their unions, who have made tenured autoworkers in industrial societies among the highest paid blue-collar workers, raising the costs of internal parts production to unsustainable levels. For some time now it has been commonplace in the industry to equate high levels of vertical integration with low levels of competitiveness, and analysts and investors have cheered as the most deeply integrated companies have closed, sold, or spun off their captive parts operations.
means that VMs can capture more reliably the wants, needs, and value perceptions of their customers and feed them back into product development processes. Much of this valuable feedback is today filtered or distorted through the dealer interface.

A corollary of the VMs’ move into downstream marketing activities is the de facto transfer of assets, responsibilities, and processes to the supply base. A shrinking but increasingly capable base of Tier One suppliers will take on greater responsibility for developing vehicle systems and manufacturing modules. The VMs, of course, will still make fundamental decisions about vehicle styling, architecture, and packaging and be responsible for integration, managing, and supervising the evaluation and resolution of the countless conflicts and tradeoffs that exist in engineering a modern vehicle. Pressures for speed and efficiency, however, will drive out the belts-and-suspenders engineering duplication that still exists today in many VMs.

These two trends amount to nothing less than a re-invention of the business of making and selling cars. As VMs turn their attention to serving customers in new ways and reorganizing their supply chains and development processes, fundamental questions arise as to their reason for being. What makes a car a car? What makes a car company a car company? Hallowed old answers will be challenged, and VMs will have to face the difficult and risky task of defining and developing new capabilities to build competitive advantage. Examples include consumer marketing, direct sales, channel management, supplier/alliance management, and shared technology development. Important boundary questions need to be resolved: Who owns the intellectual property generated in a mutual technology development project? How can VMs leverage the entrepreneurial zeal of their dealers while achieving a new standard of customer service?

VMs will have to overcome powerful forces of inertia to compete in this new business, and this is where the diseconomies of scale begin to show themselves, for the biggest players generally have the strongest constraints. Perhaps they will be able to harness their strengths and take decisive action. Or perhaps they will find themselves falling behind as smaller, more nimble competitors with less to lose streak past them in the race to define the VM of the future.