The North American automotive industry has emerged from the recession in far better shape and more quickly than predicted. While overall sales volumes are lower than in the peak years of the mid-2000s, manufacturers and suppliers are healthier and stronger. Sales are exceeding expectations, costs are down, and the industry has established a much more stable platform for profitable growth.

Our 2012 U.S. Automotive Industry Survey and Confidence Index discussed many of the industry’s current trends in detail and provided our thoughts on how suppliers and OEMs might best respond. In this letter, we will focus on how changes in the industry are specifically affecting the environment for innovation, an enduring and critical component for success in the automotive sector.

Right now, the automotive industry is in a phase of both rapid and broad technological innovation that spans several scientific disciplines—chemistry (batteries), materials science (lightweight materials), and consumer electronics (infotainment), to name a few. Given the span of innovation, it’s becoming exceedingly difficult and too costly for OEMs to “go deep” across all technologies. Additionally, some nonautomotive players have superior specialized technical capabilities and R&D scale in specific disciplines. These factors are fundamentally shifting the industry’s long-standing model of innovation—which had been centered around large OEMs and major suppliers—toward a more decentralized approach in which OEMs serve as integrators, and large and small suppliers play an expanded role.

The industry will need to innovate rapidly in order to remain competitive in an ever-changing market, where the goals include hitting more stringent fuel economy standards, boosting the electronics in cars, developing common platforms around the globe, and attracting younger buyers. Doing this requires significant R&D dollars, both within OEMs and increasingly across a broader innovation landscape.

Understanding this shift will confer real advantage to those that think strategically, act decisively, and execute their game plan. In the following sections, we frame the auto industry’s current challenges along three
dimensions: the innovation environment, the changing role of OEMs and suppliers, and strategies for the future.

The Innovation Environment
Technology has always played a central role in the auto industry. Recently, however, the pace and the complexity of technology development have increased. More than ever, advances are taking place in systems that have highly intricate linkages throughout the entire vehicle and rely on a wider variety of diverse disciplines.

Take the growing array of fuel and powertrain technologies. With numerous options and no clear winner, OEMs and suppliers are placing bets on a wide range of battery and component technologies. Some of these require step changes in development, such as designing and manufacturing automotive-scale advanced lithium-ion batteries for electrical vehicles. The addition of such a large onboard energy storage device in turn creates new requirements—like advanced thermal management techniques to maintain narrow temperature operating zones—as well as opportunities to leverage that electrical energy in new ways and improve overall vehicle performance.

At the same time, the greater penetration of smartphones and tablets is leading consumers to expect more advanced electronic content in their automobiles, and with much faster refresh cycles than have been typical in the industry. In addition to basic infotainment systems that provide vehicle information and entertainment options, more active driver-assistance technologies such as collision avoidance and autonomous parking are becoming the norm.

Government policy also affects the development of new automotive technologies in the U.S. market. The new fuel efficiency standards, which take effect in 2017, will require automakers to reduce vehicle weight and drag—by incorporating new lightweight materials for auto body parts and internal components, for example. While lightweight materials such as high-strength steel and aluminum are likely to have a greater presence in the automobile, ultralightweight materials such as carbon fiber will also gain acceptance, as increased industry adoption drives scale that reduces the cost of such components to more competitive levels. Developing these materials requires partnerships between materials suppliers, OEMs, and component manufacturers. Government regulation will also be a key factor in alternative powertrains. For example, the means of calculating CAFE compliance for electric, plug-in hybrid, and flexible fuel vehicles, combined with the level and structure of subsidies for emerging powertrains and electric recharging
infrastructure, will affect customer perceptions and economics substantially—and drive adoption of new technologies.

The Changing Role of OEMs and Suppliers
For decades, automotive innovation has revolved around the R&D centers of the major automakers and Tier One suppliers, with the largest OEMs making the most significant R&D investments. This model is changing in several important ways:

1. OEMs can no longer afford to operate with such a broad technological agenda, and they must focus on some R&D priorities while dropping others. We can already see some apparent priorities across OEMs in their focus on new powertrain technologies (e.g., hybrid-electric, all-electric, or fuel-cell).
2. Major suppliers are filling the gap, making significant investments in key emerging technologies such as batteries, motors, and vehicle positioning and guidance.
3. New suppliers, which serve a customer base beyond the automotive industry, are emerging in many of these new fields.

Because OEMs themselves are likely to control a narrower portion of R&D, the dynamics and choices they make regarding which areas to specialize in are critical and will determine their future success. These factors will inevitably lead to more technology partnerships with suppliers, such as Chrysler’s purchase of diesel engines for pickups from Cummins.

The same principle applies to suppliers, which will shoulder a larger share of rising innovation costs as OEMs cede innovation in strategic ways. This will force suppliers to decide where to make technology bets—a process that requires real discipline in evaluating the likelihood of success for a new and innovative product and the probability that others are developing equivalent or superior technology. In some cases, outsiders to the automotive industry will emerge with very real competitive advantages. For example, in infotainment, consumer electronics companies have scale and expertise that OEMs and automotive electronics suppliers cannot match, and they offer product development cycles that are significantly faster than those of automakers. Given those advantages, OEMs may choose to let consumer electronics makers take the lead in creating modular, open-architecture systems compatible with popular consumer devices such as iPhones and tablet computers. Indeed, we have already seen many OEMs move in this direction.
Strategies for the Future
All these complex, highly interactive changes spell opportunity. Winners in the North American auto industry five years from now will be those that develop a process for capitalizing on innovation from a wide range of sources—some proprietary and some open. They will need to manage the technology portfolio, evaluate scenarios (some of which may be highly uncertain), develop a better sense of market requirements, make selective bets, and adjust accordingly. Managing these investments and partnerships will be critical to their long-term success. Returns may take years to materialize, but companies that shortchange innovation today are ceding the future to rivals.

Implications for OEMs
To adapt to changing conditions, vehicle OEMs will need to strengthen their existing innovation capabilities and develop new ones in at least four ways:

1. Become experts at managing a broad, far-reaching, and active innovation network; this requires technological capabilities that historically have not resided inside automotive OEMs.
2. Focus internally on select technologies that are absolutely essential and must remain proprietary.
3. Plan for and manage the inherent uncertainty associated with this new operating paradigm.
4. Strengthen system and vehicle interaction expertise.

First, to survive in an environment of dispersed technology development, OEMs must cultivate an active and creative extended network. Such an approach means striking a careful balance between reducing production costs through competitive sourcing incentives and partnering with the most technologically advanced entities, with an expectation that more adept partners will improve vehicle innovation.

Second, OEMs will also need to make sure they are focusing their limited R&D spend in the areas where it is most critical and will have the most impact, hence incorporating a make-versus-buy discipline to technological innovation. This requires making choices, which in turn requires critical insight into the company’s own capabilities as well as those of suppliers. For example, where does the OEM need to control the technology absolutely? Where does the supplier have the scale to advance technology much more effectively? Where could a partnership be most effective?

Third, given the large number of technologies under development and the complexity surrounding their eventual adoption, OEMs need to continue to
strengthen their ability to manage uncertainty. This includes placing well-considered bets on early technology winners on the basis of economic fundamentals and development trajectories. It also means developing a strong market-sensing capability that can detect early clues regarding potential front-runners or shifts in the competition based on a range of impacts—from breakthrough scientific findings to new government regulations.

Finally, to maintain power in a shifting innovation environment, OEMs must retain and even strengthen their cross-system, vehicle integration expertise. Continuing to build this expertise will be essential to maintaining control and achieving high-level quality and reliability targets in an increasingly dispersed innovation environment. Ultimately, the OEM that gets this right has the highest probability of long-term success in the evolving general contracting/integrator operating model.

**Implications for Suppliers**

As suppliers take on more responsibility for technology innovation, they will need to become more agile and adroit in managing the technology project portfolio. This includes deciding where to specialize from an innovation standpoint, placing bets based on rigorous and deep analysis, and building a capability to identify changes in technical, market, and regulatory factors that may impact technology success.

In light of an expanding innovation role, suppliers may need to rethink their approach to contracting with OEMs and become more discerning in their evaluation of programs. For example, is there a clear path to recover costs associated with serving OEMs in the long term? Is there a segmentation of sourcing relationships across vehicle OEMs that might warrant differential pricing and/or tiered service choices? Will some programs become more or less attractive in the presence of an updated technology road map, an increased ability to refine production techniques, or greater scale in fundamental operations?

Finally, to improve the chance that their innovations will fit seamlessly and hence improve competitive positioning, suppliers will need to continue to expand their knowledge of the vehicle systems in which they play. This could involve enhanced networking or partnerships with sub-tier suppliers (such as electronics providers), market peers, or adjacent technologies, in addition to traditional OEM relationships.

**Industry-Wide Implications**
OEMs and suppliers alike will need to adapt their operating principles to allow for a more thoughtful and strategic approach. They must decide which technologies to focus on in a proprietary manner and how to develop them in a way that will increasingly, and with greater certainty, generate high returns on a growing investment in innovation. This requires an understanding of the technologies themselves, consumer preferences, and how to work within the complex new ecosystem of customers, partners, and suppliers. At the same time, companies must remain highly attuned to the role the government will play and closely monitor regulations that have the potential to shape automotive technologies, both today and in the future.

Finally, to transform the business to execute against these innovation objectives, companies will need to bolster supporting capabilities through business-wide digitization, improving the cost fitness of the organization, and strengthening the program and product management systems designed to deliver the resultant product strategies.

These are complex issues, but there is no turning back. In an era of rapid and accelerating technological advances, companies must build the superior innovation capabilities essential to success. (For more on innovation, please see Booz and Company’s 2012 Global Innovation Study.)

We welcome your thoughts and comments. Please let us know if you would like to meet to discuss how any of these issues or ideas might evolve at your company.

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