

# Cars That People Want to Buy

## Improving R&D in the auto industry

by **Jan Dannenberg**  
**Jan Burgard**

It's been estimated that the modern car is the result of over 100,000 patents. From the internal combustion engine and the mass assembly line to heated seats and satellite navigation systems, innovations have vastly improved the cars we drive. But innovations are more than just technological advancements; they also differentiate brands, adapt cars to changing customer preferences, and provide answers to global challenges. Innovation not only ensures the continued success of the automotive industry, it is also the foundation upon which the entire industry rests.

With both a rich tradition and heavy investment in innovation (the industry spends roughly €68 billion a year on research and development and employs 800,000 engineers worldwide), one might assume that the innovation management process would be beyond reproach. Yet Oliver Wyman's recent "Car Innovation 2015" study shows that only 10 percent of more than 300 automotive technologies now under development have the potential to become "blockbuster" innovations that earn revenues of at least €1 billion per year or achieve full penetration in the marketplace.

There are other sobering returns on this substantial investment as well:

- Roughly 40 percent of all R&D expenditures go to projects that never make it to serial production or are never produced in adequate volumes, because of weak customer acceptance.
- Another 40 percent of R&D expenditures are required for serial production development and to satisfy statutory requirements. But to date, only one-fifth of all R&D expenditures have served the purpose of brand differentiation.
- By the year 2015, the entire automotive industry will have spent about €800 billion on R&D, of which roughly 40 percent will be wasted.

In the face of increasing competition, stricter emissions limits, the need to reduce fuel consumption, and increasingly scarce commodities, automotive companies must create innovative and affordable technologies—particularly with regard to drive systems and materials—in order to realize the full growth potential of 90 million motor vehicles by the year 2020. But to take these innovative and affordable technologies to market, managers must build an innovation management process that is aligned with global megatrends, customer needs and desires, and reductions in processing and development costs.

Drawing on five years of project work, as well as interviews with 700 people working at automotive suppliers and manufacturers, 550 buyers of new

cars in Germany and the U.S., combined with in-depth analysis of the 315 most important technologies of the automotive industry, this article offers insights and recommendations relevant to the planning and management of innovations in the automotive industry.

### Aligning with Megatrends

Global megatrends in politics, societies, economies, and technology will affect almost every aspect of the automobile. Innovation strategies, therefore, must reflect these trends in order to meet technological standards, economic imperatives, customer needs, and government regulations.

One such megatrend is urbanization, leading to the growth of megacities. By the year 2015, 40 percent of the world's population will live in cities containing more than 1 million inhabitants. Most of these cities will experience a serious shortage of parking spaces, problems with traffic jams, and limits on emissions. Accordingly, "city cars," which have traditionally been of limited interest to the automotive industry, will likely command greater attention in the future. New technologies in this area could focus on information/entertainment systems, automatic switching between driving and relaxation positions for gridlock situations, and heightened security features.

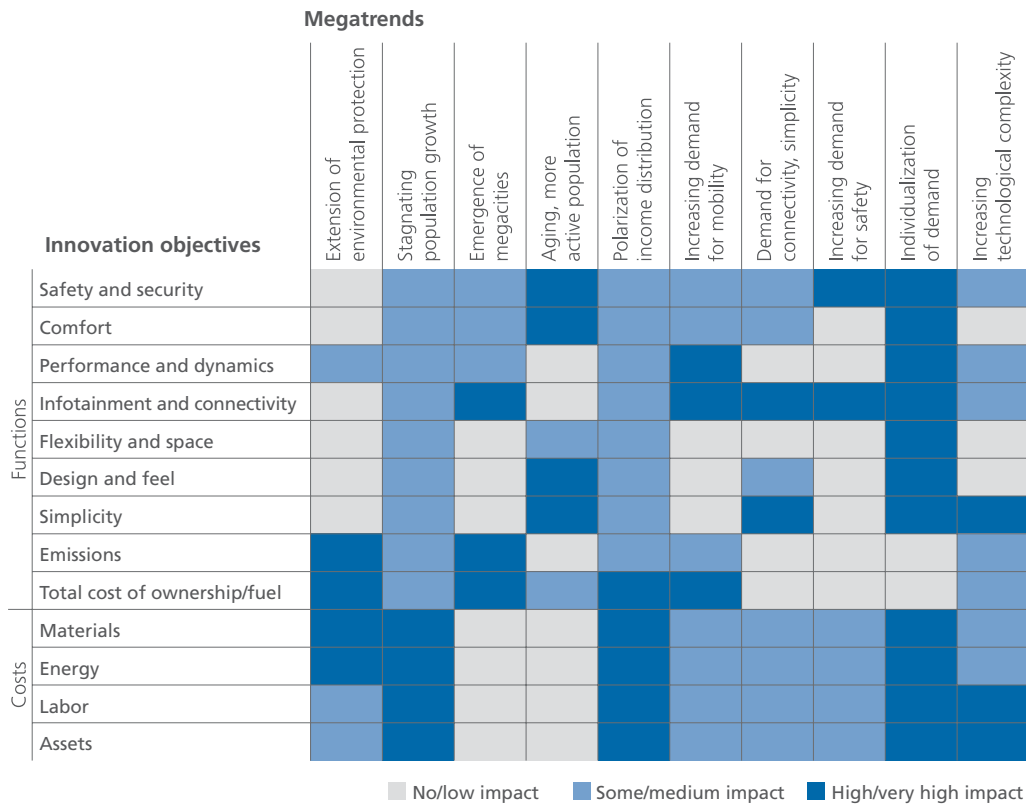
Another relevant megatrend is the widening income gap. As a result of this trend, a significant

## Technology Trends

In "Car Innovation 2015," Oliver Wyman examined 315 automotive innovations in terms of their innovativeness and market potential. Based on this analysis, we have identified three technology trends through 2015:

1. The most important innovation focus lies in emissions/fuel efficiency/weight, through the evolution of new power-train concepts and architectures.
2. Electrics and electronics will remain the most important enabler of automotive innovations through 2015 and beyond, and will grow by 6 percent annually. The sweet spots with a revenue growth of 8 percent and more will be software, semiconductors, displays, and power generation.
3. As more automotive functions become interlinked, we see a shift from single innovations to system innovations. Devices will increasingly be used for two or more functions.

Exhibit 1 Impact of megatrends on automotive innovations



Source: Oliver Wyman analysis.

share of growth in the automotive industry will come from lower-end vehicle segments. The aging population, another megatrend, does not imply that firms should build “senior” cars. Rather, it means equipping cars with design and handling features that the various elder groups will find useful, exciting, and desirable. Other megatrends and the impact they will have on the automotive industry are shown in Exhibit 1.

**Gaining Traction with Customers**

When it comes to buying a car, there are too many complicated innovations on the market, and too few of them can be grasped by customers in an intuitive way. As a result, fewer and fewer drivers know about all the functions their cars provide. For example, our survey found that 70 percent of German and U.S. car drivers know about ABS (anti-lock braking systems), but only 40 percent are familiar with ESC (electronic stability control).

Furthermore, customers are overwhelmed by the

sheer number of serial and optional equipment that can be found in automobiles. In the BMW 7 series, for example, the total number of extras rose from 14 in 1986 to 92 in 2006. Complicated feature names and acronyms often make it difficult for the customer to even guess what function a given extra could possibly deliver. Consider the Lexus GS: one-third of its features use acronyms and abbreviations.

To a large extent, the success of innovative features depends on regional differences. Asian car buyers, for example, are more interested in infotainment electronics than are their American counterparts. Plus, most car buyers have only a limited budget for optional equipment, but their price sensitivity is largely unknown to auto manufacturers.

The lesson: Manufacturers and suppliers must continually cull their innovation portfolios to ensure that they are concentrating on truly promising innovations that customers will value and be willing to pay for. They will also need to formulate and

pursue highly focused, well-integrated marketing plans that both educate buyers and car dealers and determine their genuine interest in the innovations that are currently in the pipeline.

### Downshifting Budgets

Over the past 20 years, the retail price of a new car in industrialized nations has doubled, while average personal income has increased by only half—and the gap between new car prices and incomes continued to grow. Thus, innovations designed to

lower costs will become increasingly important. To ensure that cars remain both affordable for customers and profitable for manufacturers in the year 2015, industry players will need to lower the cost of producing each car by €1,500, or 11 percent. The road to cost-saving lies in a series of interrelated issues—such as cutting material, processing, and developing costs—that must be tackled simultaneously.

To cut material and processing costs, for instance,

## Innovation Overload and Marketing Missteps

Only one of six innovations offered by auto manufacturers is actually purchased (see exhibit below). The inability to sell these innovations can be directly attributed to two factors: manufacturers and suppliers are failing to meet the real-world needs of car buyers, and the automotive industry is paying too little attention to innovation marketing.

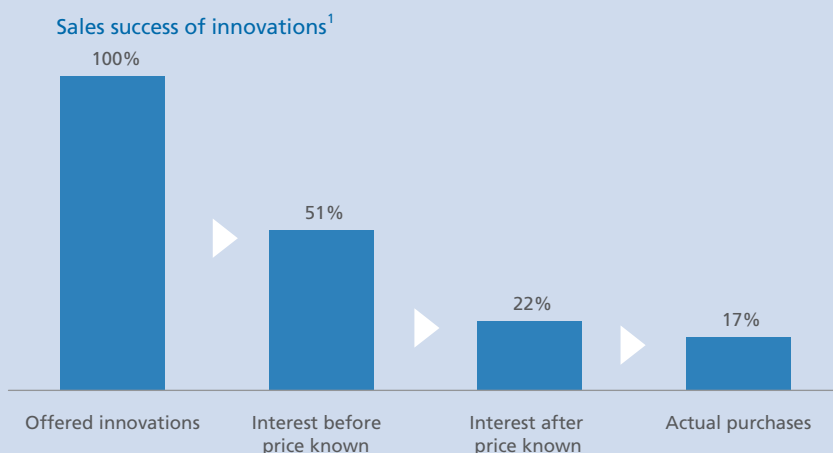
Oliver Wyman surveyed 550 new-car customers in Germany and the U.S. about their acceptance of innovations as well as their budget restrictions. Our findings revealed that drivers are unable to keep up with, or even distinguish between, the huge number of innovations. In particular, the frequent use of company-specific names (4Matic, dynamic drive) and abbreviations (HCCI, JDLS) creates confusion.

Of course, the dealer plays a primary role as an in-

formation source in the sales process. But when we evaluated 50 dealerships on their ability to explain innovative new features to buyers, we found few that were interested in selling such features and even fewer that were knowledgeable about the operation and use of specific technologies. The average amount of time dealers spent explaining innovations was five minutes; some took as long as 12 minutes, while others provided no explanation at all.

Our study also discovered that the total cost of ownership matters to consumers, who said they want a reliable car at a reasonable price. Despite customer interest in overall cost, however, auto manufacturers made this issue the lowest priority in their innovation marketing activities. Instead, most manufacturers concentrate their innovation marketing efforts on comfort and safety features.

### Only 17 percent of innovations are bought by the customer



<sup>1</sup>In Germany and the U.S.; based on 14 innovations in buying simulation

Source: Oliver Wyman analysis.

one promising avenue is the use of new materials. Flexible manufacturing concepts will improve the efficiency of assembly plants. And carefully devised bundles of options will reduce the number of possible configurations and reduce unnecessary complexity from manufacturing processes.

At the same time, development costs must also be trimmed. All large automotive companies have launched R&D offshoring initiatives to cut engineering costs and fuel localized development. Module approaches will reduce R&D costs per unit, and will allow companies to cope with a larger variety of models as well as shorter cycles. In addition, new design and test-bed software will lower the costs of developing automotive components.

These are just a few examples of the many initiatives needed to make cars affordable for the broad public. In the end, cost innovations and lower R&D costs will play a crucial role for keeping car purchases within the consumer's budget, and for industry growth.

### Driving Innovation Development

Successful innovation development requires a system of elements that fit together like pieces of a puzzle: a clear innovation strategy that is closely connected to the company's overall business design, the right team with the right culture to put the strategy to work, an organization that can effectively and efficiently steer the innovation processes, and an intelligent business case that turns innovations into tangible and profitable revenues.

Such a system, which we call the Innovation Strategy Framework (ISF), consists of four elements: the innovation proposition, competence focus and collaboration, the business case, and organization and culture. We have identified six archetypes for OEMs and six for suppliers, each of which describes an ISF profile. These archetypes serve as models to understand and improve the different aspects of innovation, from strategic R&D fit to method of value capture to barriers against copycats. Suppliers with different product ranges or OEMs with different brands might follow several archetypes at the same time. Based on the four ISF elements, we offer ten recommendations for

the improved design and structure of innovation management programs:

### Innovation proposition

- 1. Technology vision.** Top performers develop a long-term innovation vision and pursue it unwaveringly, without being distracted by short-term trends.
- 2. Knowledge of customer preferences.** A thorough understanding of customer preferences enables automotive companies to focus their innovation efforts on customer-relevant features.
- 3. Strategic fit.** Successful automotive manufacturers and suppliers match their R&D strategies to the desired target customers and network partners at a very early stage in the process.

### Competence focus and collaboration

- 4. Focused R&D capabilities.** The R&D capabilities of the best innovators are closely aligned with their R&D strategies.
- 5. Strategic partnerships.** In response to growing complexity, R&D networks will become more prominent. Currently, manufacturers are the main parties forming such networks, but supplier-supplier and supplier-institution collaborations will spread in the near future.

### Business case

- 6. Investment focus.** R&D budgets should not be affected by short-term business demands, as catching up with past R&D cuts is often quite expensive.
- 7. Orientation to megatrends.** Long-term R&D objectives should be oriented to global megatrends, which are, after all, foreseeable.
- 8. Cost discipline.** Innovation leaders maintain a strict cost discipline with respect to R&D efficiency and effectiveness. Reducing unit costs is a cornerstone of their efforts.

## Organization and culture

**9. Outside-in strategy.** Top performers concentrate on innovations that will be accepted by the market. They terminate, at an early phase, projects that hold little promise of profitability.

**10. Employee involvement.** Companies that involve their employees in their R&D activities on all levels are much more successful innovators. Some guidelines are low hurdles for submission of ideas and transparent filters for those ideas.

## The Road to Successful Innovation Management

For more than a century, the automotive industry

has relied on innovations to continuously improve the cars that roll off the factory floor. In the face of growing demands as well as increasing constraints across the industry, companies will be relying even more on innovations. They must also put the appropriate strategies and processes in place to make the most of these innovations.

By embracing innovation trends and developments from outside the industry, focusing more strongly on customers and marketing, rethinking their processes to control spiraling costs, and regularly checking the alignment of their innovation strategies, automotive manufacturers and suppliers will be well on the road to improving their innovation management processes. ❖

Jan Dannenberg is a Munich-based director and Jan Burgard is a Munich-based senior associate of Oliver Wyman. They can be reached at [jan.dannenberg@oliverwyman.com](mailto:jan.dannenberg@oliverwyman.com) and [jan.burgard@oliverwyman.com](mailto:jan.burgard@oliverwyman.com).